The Builder.

VOL. LXXXVII.—No. 3215. SEPTEMBER 17, 1904.

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Winsley House, Wilts .....Messrs. Silcock and Reay, Architects.
Church of St. Chad, Longsdon .....Mr. Gerald C. Horsley, Architect.
Congregational Church, Dover .....Mr. F. Newman, Architect.
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The Condition of the Philæ Monuments.

IN a recent article upon "New Irrigation Works for Egypt and the Soudan" we mentioned the proposal for the raising of the Assouan Dam, which necessarily involves the further submersion of the Philæ temples and other buildings on the island. That this part of the large programme now put forward is likely to be carried out is evident from the despatch of Lord Cromer, who says :—"The first new work which, I venture to think, should be undertaken, is the raising of the Assouan Dam." Although it is now too late to protest, there is every reason for vigilance as to the actual effect of existing submersion, and as to the probable effect of further submersion. We have already described in detail the measures taken for safeguarding the ruins from injury,* and, in a subsequent "Note," to the favourable report made as to the success of the underpinning works. At the same time, however, we drew attention to the disquieting statement by the Director-General of the Antiquities Department—M. G. Maspero—as to the absorption of water by masonry above the reservoir level. Further information upon both these points is now available. Sir William Garstin has recently assured the public that, thanks to the thorough and skilful manner in which the foundations have been consolidated, there have been no signs of subsidence, and that there appear good grounds for hoping that none will occur in the future. Other testimony is forthcoming from Mr. E. Naville, the eminent Egyptologist, who visited the temples last year after the water had subsided, and his opinion is the more noteworthy because he was one of those who protested most strongly against the submersion of the temples when the project was first mooted. The following quotations sufficiently express the impression received by Mr. Naville on the occasion of his visit:—"What a change in Philæ from formerly! One can no longer call the temple a ruin; it appears, except in matters of small import, like a structure erected quite recently." And, again:—"One may ask himself whether, in certain respects, the temple of Philæ is not to-day in better condition than the greater part of the Egyptian buildings."

The conclusions drawn by M. Maspero, from careful inspection of the buildings during last winter, are thus stated in a pamphlet published this year:—"The established facts regarding them are reassuring, and show us that the works undertaken to enable the temples to stand the test of the water have not been in vain. The first year has passed well, and I hope that the second year will bring us no disappointment." He adds:—"The danger of failure through undermining action of the waters appears to be averted, thanks to recent works, and the current, if not quite *nil*, is certainly so feeble during the period of immersion that one may consider its effects as negligible."

Referring to the same point, Sir William Willcocks said in a recent lecture at Cairo:—"A great deal of the opposition to the annual inundation of Philæ, for four or five months per annum, came from a misapprehension. People confused the damage done by the salty percolation water, which filters up through the soil in flood time and works such havoc at Thebes, with the really preserving effect of the freshly-flowing Nile water. One destroys stone, the other preserves it. The retaining walls of Philæ temple, which are annually inundated for six months per annum, are better preserved than any other part of the temple. It is the same with all stone and brickwork on the Nile. The submerged parts are better preserved than the parts which are never submerged."

The evidence we have quoted above leaves little, if any, room for doubt as to the efficacy of the underpinning works, and removes all feelings of apprehension relative to the possible deterioration of the masonry below the high water-level of the reservoir.

But another and more serious question remains to be considered; that is, the action of the water upon the surface of the stone above the water-line. All who have inspected the buildings since the reservoir has been in operation agree in stating that along this level there is a band of saturated stone, varying from

*The *Builder*, Vol. LXXXIV., No. 3128. January 17, 1903.

0·60 to 0·80 metre in height. As we have previously pointed out, the saturation in question is due to capillary attraction, and it is quite established that deleterious salts have made their appearance in the band. The only remedy suggested for this undesirable development is that the masonry should be thoroughly washed every year after the reservoir has been emptied. The salts are reported as being readily removable, but at the present time it is impossible for any one to say whether such treatment will effectually preserve the stone from disintegration. In the opinion of M. Maspero, who is an acknowledged authority, no reliable decision on the point can be made until four of five years have elapsed.

From the structural point of view, the raising of the dam will simply have the effect of shifting the saturated band to a higher level. The present band of salt will be washed off, and a new band established around the upper parts of the temple. Further, the continued stability of the buildings must be better assured by the removal of the danger zone to a higher level.

No one can possibly doubt that the further submersion of the temples will completely destroy what little remains of their picturesqueness during certain months of the year, which unfortunately are the very months when tourists chiefly visit Philæ.

Assuming the reservoir level is to be raised, the public have a choice of two evils. One is to accept the position as it will then stand, the island and its buildings practically lost to sight just when travellers want to see them, and possibly suffering deterioration as a result of their annual soaking. The other is to fall in with the suggestion made some time ago, presuming this to be still open, that the principal temple should be removed and re-erected on the adjacent island of Bigeh, which stands high above the waters only a few hundred yards distant from Philæ. The proposal previously made was that 200,000*l.* should be handed over to the Antiquities Department to cover the expense of removal and re-erection, and we have no doubt the building could be transferred to a suitable site for this amount. But even if the work were successfully and artistically conducted, as we are sure it would be by M. Maspero, the result would be worse than unsatisfactory. As may be seen by the plan we published on a former occasion, the entire island is covered with buildings of more or less interest, and even if the whole of them were transplanted, they would be bereft of the surroundings which have become part and parcel of their existence by long-continued association. If one temple only were to be removed it might almost as well be re-erected in Cairo or South Kensington. On the whole, we are inclined to think that the temples should be left where they are, and that the proposed removal of one of them, even if the structure appeared to advantage in its new position, would be an act of Philistinism for which it would be difficult to find any excuse.

The whole subject is rather a sad one, to those who look to the past as well as the present of the world's history. The commercial benefit to Egypt of increased irrigation is of course immense, and it may be thought that no archæological considerations ought to be allowed to interfere with it; and in the case of many localities in the world this would be a perfectly reasonable argument. But Egypt is altogether exceptional. It is our great link with the pre-historic past; it is the book of early art and civilisation; nor do we yet know what more may be found in it. To obliterate and drown the monuments and relics of ancient Egypt, for the sake of the modern population, may seem to the engineer and the political economist a natural and laudable course of action. But it should at least be remembered that they are wiping out records of the intellectual history of mankind, which, once destroyed, nothing can ever replace.

ROBERT ADAM AND HIS BROTHERS.

THE Essay which gained the Architectural Association Essay Prize for the Session 1902-3, on "The Life, Work and Influence of Robert Adam and His Brothers," by Mr. John Swarbrick, after appearing in the pages of *Architectural Association Notes*, has been reprinted in pamphlet form, of which a copy has been sent to us.* Though in general we should not devote a separate article to the review of a pamphlet, Mr. Swarbrick's careful and well-written monograph on the subject, for which he deserves all credit, affords an opportunity for a consideration of a career which formed an important chapter in the history of modern English architecture, and to which there is nothing analogous in the modern developments of Renaissance architecture in any other country.

To weigh correctly the reputation enjoyed by the Brothers Adam, and to assign them their position among the architects of the XVIIIth century, is not, as Mr. Swarbrick confesses, an entirely easy matter. He has nevertheless attempted a short estimate of their influence, although the greater part of his essay is occupied with a comprehensive review of their work and career, compiled, as the appendix shows, from a great variety of sources. The task is difficult, it is further explained, in consequence of the diverse character of their undertakings. This, in a sense, is so. And it is perhaps only by considering their works as a whole, as the Adams themselves treated them, that we are likely to arrive at a result.

From the "Works of Robert and James Adam" the author selects a passage which may be taken as a manifesto of the Brotherhood:—

> "The massive entablature, the ponderous compartment ceiling . . . almost the whole species of ornament formerly known in this country are now universally exploded, and in their place we have adopted a beautiful variety of light mouldings, gracefully formed, delicately enriched, and arranged with propriety and skill. We have introduced a great diversity of ceilings, friezes, and decorative pilasters, and have added much grace and beauty to the whole, by a mixture of grotesque stucco and painted ornament. . ."

In effect they meant to imply, as we read it, that the style inaugurated by Inigo Jones and Wren, or at least as practised by their contemporaries, Chambers and Paine, was ostentatious and meaningless, and that they sought to produce a simpler effect, though none the less telling, by a combination in which stucco and painted ornament, and, we may add, the general upholstery of a building, played no inconsiderable part. And if we look round at what was taking place in literature, poetry, and in painting, we must recognise that the Adams were not alone in their quarrel with tradition. The polished style of the Essayists was giving place to the varied interests evoked by the story, told in the simpler language of Goldsmith. The stilted invocations to the Muses, practised by the earlier XVIIIth century poets, was being supplemented by the more homely touches of Blake, while the pompous portraiture of Kneller was rendered ridiculous by the *naïveté* of Reynolds. And in architecture we cannot doubt that the tendency was the same; but, unfortunately, there was no one great enough to grapple with the problems that architecture presented. The interest of the story meets an inadequate parallel in the upholsterers' art, and the simple charm of Blake and Reynolds finds no echo in the baldness of architectural features.

That Robert Adam was at heart a Romanticist pure and simple no one can doubt who has studied his design for "A Palace," which he made in Rome in 1757, before he commenced practice. Mr. Swarbrick properly points to it in evidence of a gift for aerial perspective of the Vanbrugh school. It displays this truly, and in an eminent degree. But it further displays a luxuriance of composition and an unchartered freedom in the handling of form that is almost mediæval in its sentiment though classic in detail. It was never intended, of course, for execution; but it is here, as one is inclined to think, and not among the somewhat tame proprieties evinced in the Admiralty screen, that the real Robert Adam will be found. Jean Baptiste Greuze was in the same year elected to the French Academy. His diploma picture, entitled "Septimus Severus and Caracalla," was passed over, and he was elected on his merits as a "*genre* painter"; and the distinction so pointedly made nearly broke his heart. That Adam would have been equally disgusted had his claims as an exponent of classic art been disputed, there can be no doubt, despite his openly expressed detestation of Palladio.

We look in vain amongst his drawings for some evidence of serious study whilst abroad. Sketches of ruins standing in appropriate surroundings bear his initials, but these are rather the excursions of the *dilettante*, and there seems to be little to show that he studied or measured old work. He spent some years in Rome, making the *grand tour*, as was essential at that time for anyone who claimed to be a person of taste. His brother James joined him abroad. James would appear to have been the better draughtsman of the two, and if we may judge from his design for the Parliament House, which he made there as an essay, after the manner of his brother's design for "A Palace," he was also the more orthodox in his views upon classic detail.

* "The Life and Work of Robert Adam and His Brothers; being the Prize Essay of the Architectural Association for the Session 1902-3." By John Swarbrick, A.R.I.B.A. Hazell, Watson and Viney, London and Aylesbury.

He was also something of a figure draughtsman, if we may rely on the drawings for the decoration of the Parliament House as being entirely his own.

But two expert water-colour artists accompanied the brothers on their tour, Clérisseau and Zucchi. Robert took lessons from the former before proceeding south. They were commissioned by Robert to make copies of the decorations to be found in Italian villas and palaces, and these are very beautifully executed. One or other, probably Zucchi, must also have been responsible for the drawings of the Palace of Diocletian at Spalato, which were engraved by Bartolozzi, and published in a handsome volume with magnificent type as a dedication to the King, who is compared therein to Pericles, Augustus, and the Medici, as patron of the Arts. The Temple of Jupiter at Spalato appears in all the Adam designs that make pretensions to importance. The "Design for a Palace" bristles with it. It appears in the "Design for a Parliament House," and the scheme for rebuilding Lincoln's Inn, which happily never took shape. It may be found also in the designs for country seats executed by the brothers —at Keddleston, for instance, where it formed a part of the "improvements" to Paine's design after the latter's dismissal.

Robert Adam commenced practice shortly before 1760, and was afterwards joined by his brother James. There were four brothers in all, but John, who succeeded to his father's business in Edinburgh, and William, also an architect, do not seem to have been much concerned in the joint productions of the other brothers. Robert held the personal appointment of Architect to the King, one with which the publication of the volume previously referred to may not be unassociated. This form of homage was one of the undesirable features of the age.

Commissions flowed in from wealthy clients. Kenwood was erected for Lord Mansfield, Luton House for Lord Bute, and some work at Zion House was undertaken for the Duke of Northumberland. Clérisseau and Zucchi came to England to assist. Indeed much of the brothers' time must have been taken up by the management of their business, which included extensive operations of a speculative character. Among these were the Adelphi and numerous streets, such as Mansfield-street, Grafton-street, and Stratford-place. It was shortly afterwards found necessary to dispose of the Adelphi by public lottery. Nor was their enterprise confined to building alone. They purchased the right to deal in a patent cement, and became harassed by legal difficulties arising therefrom.

We cannot help thinking that to their remarkable activity must be attributed some of the prestige which has fallen to them as designers. Styles are not born in a day, and there is much about the so-called "Adam style" of ornament, and the handling of it, that may be attributed to a natural development in the decorative trades, to which the Adams gave advertisement by their numerous undertakings. "The Octagon" at Bath was erected in 1767 by an architect of the name of Lightholder. It is a charming piece of work, the ornament retaining the strength of more virile times and being most skilfully disposed. It would in ordinary phrase be called "Adam style," but it has always seemed to us to be something very much better than the Adams ever did. As regards the fittings generally, also of the Adam period, if we look at Jones's "Gentleman's and Builder's Companion," published in 1739, we shall find the same forms; it is the ornament that is lacking. Multiplication of ornament is precisely the line that development at this point would take. The furniture and the decorative trades were exceedingly active at this time. Chippendale had created a fashion that was working itself out in a perfectly legitimate manner. Heppelwhite, Sheraton, Richardson, Wallis, Wyatt, these were all active in the cause. This branch of the Arts the Adams certainly helped forward, and their folios contain many designs by experienced hands. The rough drawings, made apparently by one or other of the brothers, seem to us as even barely suggestive, and would most certainly be quite inadequate for their purpose unless their translation were undertaken by experienced workmen. We therefore cannot agree with Mr. Swarbrick that the building and decorative trades were in so decadent a condition that they necessitated an infusion of "Adam" culture.

One feature in the decoration of the period is almost universally resorted to by the Adams—the introduction of isolated panels, containing groups either modelled or representing sculpture. This was very possibly an invention of their own, and when one studies the water-colour drawings made by Clérisseau or Zucchi, or indeed any artist who made up what he considered to be a scene typical of Roman topography, panels and fragments of ancient sculpture built into the walls in a negligent and picturesque manner, are never absent. These panels and medallions appear upon the façades and in the interior decoration of all the Adams' work, and the architecture is often entirely subordinated to provide a place to receive them. A device of this kind—usually the central feature of a façade—appears in their windows. Three openings are grouped in a recess which is surmounted by a semi-circular arch. They are covered by an architrave, and the semi-circular panel is filled by a medallion. It is when the architects get right away from the accepted classic forms that we find the expression of artistic judgment in the selection of detail. A certain boldness of design was no doubt often forced upon them by the economical necessities of their enterprises, but this is generally relieved by some bits of detail possessing charm. The houses in Mansfield-street are a type; plain brick structures with openings unrelieved even by the red brick arch and jambs of the Queen Anne builder; but the design of the entrances at once imparts to them a certain distinction. On the other hand, nothing could be more commonplace than the pseudo-classic of the Adelphi-terrace façade, usually attributed to James, and it may well have been in Mr. Gwilt's mind when he spoke of "depraved compositions." In their designs for mansions, of which Luton House may be taken as an example, they abandoned the principle of attached wings set up by Vanbrugh, and pursued in by Paine and Leoni, preferring rather to group the accommodation in a single block. This arrangement presented the opportunity of placing a series of rooms communicating with each other through which a "vista" was obtained, the "vista" being a feature upon which the architects prided themselves. This may be said to be their main contribution to the possible varieties of planning.

Mr. Joseph Gwilt was perhaps too severe when he spoke of "the depraved compositions of Adam which were not only tolerated, but had their admirers." Yet it cannot be denied that there was something of a *feu de joie* both about their style and the manner of advertising it, following upon and ending a century of serious architectural endeavour. An eminent painter once said to his critics, "You tell me that I am a very bad painter, but you must at least admit that I have been a very successful one;" and whatever view may be taken of the Adams as architects, it must be admitted that they were very successful architects.

THE TRADES UNION CONGRESS.

THE thirty-seventh annual Congress of Trades Unions was held this year at Leeds, and its meetings have extended over a week, but the questions discussed have not been those which are principally associated in the public mind as being within the province of those bodies. It is clear that the Trades Unions are still smarting under the decision given by the House of Lords in the Taff Railway case, are pledged to secure legislation which shall override the effects of that decision; but nothing new has been said on this question, and it is apparent that the principle of making the Union funds liable in case of illegal action on the part of the Unions' governing bodies has been advantageous to the country at large, and especially to the working members of the Unions. It has done more to terminate the acrimonious feeling which was springing into existence between capital and labour on account of the aggressive action of the Unions in strikes, than arbitration or any other expedient hitherto suggested; and yet statistics show that the position of labour in relation to capital has not become in any way less favourable than it was before, and that the working members have drawn direct benefit from those peaceful relations.

Mr. Horsfall (who read a paper also before the British Association on the same subject) moved a resolution on Housing Reform and the question of slum areas. Although we cannot agree with the advanced Socialistic ideas expressed by Mr. Horsfall before the British Association, much is to be said in favour of some of his views in securing attention to the growth of new areas and suburbs so as to insure sanitary houses and a free influx of light and air. Unless the local authorities exert their powers in this direction, it is clear that the municipalities will have spent the public money in vain in pulling down bad houses in the congested areas and in erecting sanitary dwellings; for unless strict supervision over the extended areas is exerted, the

slums and rookeries will only spring up elsewhere. Dr. Smart pointed out in his address before the British Association, on which we commented in our issue of September 7, that this difficulty was already being experienced in Glasgow, where the question of municipal improvement in these respects has been most carefully investigated by a Special Commission. The real problem which requires solution is, how is this supervision to be effected without paralysing individual enterprise? The purchase and holding of large areas by municipalities, which (as mentioned elsewhere) is the system prevailing in Germany, would really be the best way of dealing with the problem, but it would probably meet with much opposition in this country.

It is disappointing that the Congress expressed no opinion on the recent Report of the Departmental Committee on Workmen's Compensation—a Report in which the divergent views of the employer and the employed have been so carefully considered, and the balance between them so skilfully maintained. The Shop Assistants moved a resolution that all legislative proposals applying generally to labour should be made to include shop assistants. It is to be observed that the Committee on Workmen's Compensation did not recommend the direct inclusion of shop assistants in the Act, yet it seems somewhat questionable whether the definition of "warehouse" suggested in the Report would not to some extent include them, since the distinction created by the Courts between wholesale and retail business in this connexion is intended to be abolished by the suggested definition. The only resolution made on this subject of Workmen's Compensation ignored the existence of any Commission, although it raised points fully considered by the Committee.

The usual resolutions were carried advocating a universal eight hours' day, and the compulsory employment of unemployed at "fair wages," though no suggestion is made as to how "fair wages" are to be ascertained or obtained if the laws of supply and demand are to be superseded.

THE CASE OF AYLESFORD BRIDGE.

A PROTEST has been publicly made against an intention which was announced (though there is some reason to believe that it has now been abandoned) to destroy the picturesque old bridge at Aylesford and build a new and wider one in its place, with (presumably) a better gradient. The question brings up once again the often-repeated and often-debated question of practical convenience as against historical and archæological interest. Archæologists are too apt to overlook or undervalue the practical side of such questions; and we preferred to make our own inspection and inquiries rather than rely on the evidence of the representatives of the Society of Antiquaries and the Society for the Protection of Ancient Buildings.

Nothing could be more picturesque than the approach to Aylesford on foot from the railway station, along the towing path which skirts the bend of the Medway. First we pass the beautiful old bit of mediæval building, part of the remains of the ancient Priory, and now called "The Friars," standing on the extreme verge of the stream and reflected in its water, as shown in our illustration (see lithograph plate). From this point the bridge and the little town cannot be seen; following the curve of the river a little farther, we come on one of the most picturesque scenes of its kind to be found in England: a small wharf opposite, with houses rising above it, and above them the church tower, which stands highest of all, and in the foreground the old bridge, with its wide centre arches and small side ones, spanning the stream and leading into the town. Our illustration, which is taken further down on the bank, from the other side of the bridge, does not give the best idea of its picturesque value. It is as seen from the side of approach from the railway that it shows best, as the foreground object in a composition of river, bridge, barges, houses, and church tower. As to the essential value of the bridge in the picture there can be no doubt whatever. Destroy that, and replace it by a modern bridge, and the charm would be gone for ever.

Is there sufficient practical excuse for doing this? Intelligent inhabitants who admire the old bridge, tell us that it is a considerable inconvenience; that it is an obstruction to the river traffic (though we saw several vessels pass under the central arch without being visibly "obstructed"), and that it is awkward for carriage and cart traffic; two carriages can just pass, but not very conveniently or safely (the parapet is not high), and of course the bridge rises up over the centre arch with that inconvenient gradient which is the common property of most ancient bridges in this country. If Aylesford were a large and busy place this would be a serious argument. But it is a very small place—hardly more than a village; and the street onto which the bridge abuts is not very much wider than the bridge itself. The serious complaint as to the bridge, in relation to carriage traffic, may perhaps come rather from owners of carriages residing in the country round, who occasionally have to cross the river that way. But this is surely but a small and occasional inconvenience,and might be put up with rather than destroy an almost perfect picture. In short, we recognise that there is a certain inconvenience in retaining the bridge, but we do not think that this amounts to sufficient to justify its removal when we consider its great picturesque beauty. Aylesford would lose far more than it would gain by the change.

According to Mr. Clinch's letter in the *Times* (which is our only authority for the statement), the Society for the Protection of Ancient Buildings have drawn up a large scheme for saving the bridge, by proposing a new cut across the flat land, following the chord of the long curve here made by the river, and a new bridge near the railway station. We would rather have seen this proposed as a navigation improvement independent of the question of the bridge at all. It would be a real improvement and convenience to the navigation, but it would cost a great deal more than building a new bridge, and it may be questioned whether the idea of turning the channel of a river to save the bridge would not appear to a good many people a rather absurdly illogical proceeding. But in itself it would be an improvement worth making, and would have the contingent advantage of leaving the bridge alone.

Another part of the Society's scheme is that the old bridge should be widened by the addition of timber foot-passenger gangways at the sides. This is one of the curious instances of the manner in which archæologists, in dealing with these matters, are constantly putting themselves in the wrong. The bridge is built on the old and usual plan of cutwaters against each pier, forming triangular refuges at the road level. The proposed timber foot-ways would destroy the whole character of the bridge, without adding to the carriage way (which is the real difficulty); you might just as well remove it entirely as tinker with it in this way; and we are certain that if any one else had made such a proposal, the Society for the Protection of Ancient Buildings would have been the first to denounce them for "vandalism."

NOTES.

Sculpture and the Chantrey Trust. NOW THAT more elasticity has been afforded, by the decisions of the Special Committee, to the action of the new Trustees who will before long be appointed, may it not be possible to utilise whatever sums are expended on sculpture for placing fine works of sculpture in our public parks and squares, instead of consigning them to the Tate Gallery? A comparison of our public parks with those of other cities, such as Paris, Berlin, Vienna, and even less important cities, such as Stuttgart (where a fountain with a group from a fairy-tale subject fascinates all who see it), might convince Londoners how much might be done in this way, and how little has been done. Works in marble may be too costly and delicate to expose to the open air; but works in bronze, with stone or granite pedestals, can be so placed. Those that we already have are, with few exceptions, but poor affairs; why not use some proportion of the Chantrey fund towards procuring finer examples of modern English art? For one person who would see a work in a gallery there are a hundred who see it in a park or a square, and it would have the advantage of open-air lighting and of architecture or foliage as a background.

The Lord Chamberlain's Theatre Rules. THE new rules have been issued by the Lord Chamberlain's office to the theatre managers. They are more comprehensive than heretofore, but they are equitable and reasonable, and no manager can take exception to them. There are two or three notable innovations, and amongst these we think the most important is the rule ordering that the scenery of the stage be rendered and maintained "non-inflammable." This is fire prevention in the true sense. It is what has been recommended by those who have had most experience in these matters for many years, and in the earlier years, as a rule, was only met with ridicule. It

has apparently required the Chicago theatre fire to bring about this change, but now that the change has been made, and the requirement has been put into print, we trust the rule will be honestly observed, and that the makeshift of superficially applying patent paints and the like will be replaced by a thoroughgoing impregnation of the highly-inflammable materials so often found on the stage. Another notable innovation is that the rules clearly specifies that responsible trained firemen should be engaged on the stage. Further, we observe that the theatre manager is now compelled to report to the Lord Chamberlain and to the Fire Brigade any outbreak of fire, no matter how small. This again is a matter of the utmost importance, because secrecy in such matters generally finally leads to some serious misfortune. Altogether the Lord Chamberlain is to be congratulated on the new regulations, which certainly cannot in any way be deemed hardships to those engaged in theatrical enterprise.

Designing our Suburbs.

MR. T. C. HORSFALL, of Manchester (well known as a pioneer in many movements for the public good), calls attention, in an admirable letter in the *Times*, to the importance of carrying out new suburbs around large towns upon a pre-arranged plan and in such a manner as to ensure that the suburban buildings do not assist in further choking the city. Considering that we have carried out so many bit-by-bit improvements in London itself, with no reference to any comprehensive scheme and no forethought as to future laying of street lines, it may seem rather putting the cart before the horse, as far as London is concerned, to speak of doing in the suburbs what we have so lamentably neglected in the city. But the development of a new suburb in a special locality at any rate affords an opportunity which can be dealt with to a certain extent separately, and without being complicated by the existence or absence of a general scheme. It is at any rate possible to see that such a new locality is laid out with wide streets and with a sufficiency of open spaces; if other suburban neighbourhoods have been built regardless of such considerations, at least let a new one not add to the evil. For London it is we fear too late for any general scheme of suburban expansion—so much has been already done independently of any such scheme, and the area to be dealt with is so vast. But provincial cities whose belt of suburbs lies within more manageable limits may well take up the idea of laying them out on a general plan.

Treatment of Suburbs in Germany.

CONTINUING the same subject, we may add that in Germany, for at least twenty years, every city of note has had its "development plan," according to which all new thoroughfares have been laid out with due regard to public convenience and to public health, and to the due arrangement of parks and squares. In several cities, notably at Berlin, these "development plans" have been accompanied by special legislation; but as a rule, special municipal powers, or the ordinary municipal powers backed by special ordinances from the Home Office authorities, have been sufficient to obtain what was necessary in compelling the surrounding landowners to conform to the official plan. As a rule too, but very little opposition was met with as far as these landowners were concerned, for the systematic development of the suburbs was so obviously to their interest that most of them voluntarily gave up rights-of-way and even ground in order to facilitate the wishes of the authorities. The greatest authority on the subject of the development of cities is at present Privy Councillor Stuebben, an hon. corresponding member of the R.I.B.A. In the first instance, Cologne saw its splendid development under his tenure of office as City Architect, but he was also responsible for the development plans of a number of other cities. At the present moment he is acting as High Commissioner for the Prussian Government in the development of the town of Posen, where the old fortifications and military lands surrounding the town are being transformed to the uses of civic life. Any one who has watched the systematic development of German cities during the last two decades must have been struck by the benefits accruing from the principles observed in that country.

Failure of Hoisting Tackle at Chatham.

NO EXPLANATION is at present available as to the cause responsible for the mishap which occurred at Chatham Dockyard on Tuesday last, during the erection of the new 130-ton shear legs. The three massive columns, about 150 ft. long, forming the legs of the apparatus, were in process of being hoisted into position, and when they had been raised to a height of 70 ft. an iron bollard, embedded in brick and cement to a depth of 6 ft., was pulled from its foundations by one of the wire ropes connected with the hoisting tackle and swung into the midst of the machinery. In consequence of this failure, portions of the tackle gave way, another bollard was partially displaced, and the shear legs fell upon the baulks of timber by which they had previously been supported. The columns were seriously buckled, but the machinery and the men working upon and near it were protected from injury by the timber supports. Two men were seriously injured, one by the falling tackle and the other by falling with one of the columns, although happily no lives were lost. The suggestion is made that the bollards were supposed to be capable of withstanding double the strain that was actually placed upon them, but it is quite evident that there has been some miscalculation. When a bollard is employed in the usual way, for hauling vessels by means of hawsers, force is exerted in a direction perpendicular to the axis of the post. It may be that the calculated resistance was based upon this condition, and that proper allowance was not made for the different direction of the pull exerted during the hoisting of the shear legs. Investigation will doubtless throw light upon this misadventure, which is the more surprising when we bear in mind the great care always taken by dockyard officials to provide for the safe execution of engineering work.

Landlord *v.* Tenant.

AN important case bearing on this subject is that of Foulger *v.* Arding, decided in March, 1902. The word "impositions" inserted in the covenants in the lease which set out the liabilities respectively to be borne by landlord and tenant placed the burden of remedying a nuisance, on the requisition of the Public Health authorities, on the tenant. In our comment on this case (the *Builder*, March 22, 1902) we pointed out what words in a lease would probably suffice to remove all liabilities of such a nature from the landlord and place them on the tenant. We have from time to time given other instances of liabilities imposed, as, for instance, the expenses of making up streets under the Private Street Works Act, and have also shown how hardly this may bear on tenants on short leases. The latest development of the principle laid down in Foulger *v.* Arding only emphasises the necessity of landlords and tenants carefully considering what their respective rights and liabilities are to be, and settling the covenants in the leases accordingly. By section 101 of the Factory Act, 1901, after January 1, 1904, no underground bakehouse is to be used unless certified by the district council as suitable for the purpose. By subsection 8, where any premises have been let as a bakehouse, and the above certificate can only be obtained by carrying out certain structural alterations, the occupier may apply to the Court of Summary Jurisdiction to have such an apportionment made of the expenses of the alterations between himself and his landlord as may appear to the Court to be just, "regard being had to the terms of the contract between the parties; or, in the alternative, the Court may, at the request of the occupier, determine the lease." In two cases recently heard—Goldstein *v.* Hollingsworth and Morris *v.* Beal—it has been decided that where premises are let as a bakehouse—which has been interpreted to mean only for use as a bakehouse—the section applies, but that the expressions "impositions and outgoings" or "outgoings" alone in the lease, sufficed to place the whole burden upon the tenant, since, even if the Court of Summary Jurisdiction did make an apportionment, the landlord, by virtue of the lease, could recover his proportion back from the tenant. The very general nature of the words used in leases makes it extremely difficult for parties to determine their position in regard to their rights under specific Acts of Parliament such as the above.

The Birthplace of the Railway System.

AT a meeting of the Parish Council of Yarm, near Stockton-on-Tees, it has been decided to commemorate the inauguration of the first railway in the world by placing a tablet on the front of the "George and Dragon" Hotel. It was in this building that a meeting was held, on February 12, 1820, for the purpose of deciding upon the construction of the Stockton and Darlington Railway, the pioneers of the movement being Mr. Benjamin Flounders and Mr. Thomas Meynell, both residents in the town. Mr. Meynell, the first chairman of the line, took a leading part in drafting the Bill which ultimately received the

sanction of Parliament. The original proposal was to work the railway with horse-traction, but Stephenson's steam locomotive was afterwards adopted, and powers were obtained to use it for the purpose of haulage. It is stated that of the subscribed capital of 120,000*l*., the amount of 17,000*l*. was raised by the inhabitants of Yarm. Remembering that the aggregate length of the world's railways is now more than 510,000 miles, the historic importance of the meeting is very evident. The visitor will find nothing suggestive of progress or change in Yarm. It is, without exception, one of the most delightfully old-fashioned towns in the land. Practically the only street is the broad Market-place, paved with cobbles, save where a narrow strip of macadam runs for the convenience of modern travellers. Near the middle stands the red-brick market hall, and the tall houses on either side present interesting examples of English architecture, and varied shades of rich but mellowed colouring. Among the many old-world towns of Great Britain, Yarm occupies a unique position, and the aspect of its fine old street is not readily forgotten.

The Irrigation Conference at Simla.

IT is to be hoped that the conference of irrigation experts at Simla, convened by the Government of India, may have the effect of encouraging and assisting the cause of irrigation. No branch of the administration has been more successful, for fully 30,000,000 acres have been added to the cultivated land of India, or more than one-fifth of the total area devoted to agriculture, and there are now in existence 43,000 miles of irrigation canals. In spite of the great progress made during the last twenty-five years, much remains for accomplishment. In Mysore existing canals require attention. In the Lucknow and Barabanki districts canals are much needed. The Deccan and Gujarat await further development, and there are many extensive regions where nothing but water is wanted to obtain plentiful harvests from lands that are now dry and scorched by an ever-blazing sun. Bengal still presents many openings for irrigation, and in Assam very little has been attempted hitherto. To give some idea of the immense opportunities for the irrigation engineer, we may state that upwards of 100,000,000 acres of land in the Indian Empire remain to be reclaimed and brought under cultivation. Whether carried out by the Government or by private enterprise, irrigation works offer a remunerative field for British capitalists and afford a sure and permanent protection against the risk of famine.

The Light Standard for Photometry.

THE important paper read to the British Association by Mr. Clifford Paterson, who is in charge of the photometric department of the National Physical Laboratory, on the ten-candle power Harcourt pentane lamp, will be read with great interest by gas and electrical engineers. The gas referees some years ago adopted the pentane lamp as their ultimate standard of reference, and the Parliamentary standard candle was formally rejected. It seems, however, that the light given out by the pentane lamp is very far from being constant. Mr. Paterson has found that it varied with the height of the barometer and with the quantity of moisture present in the atmosphere. During his experiments the candle power varied between 9·4 and 10·4, that is, a variation of 10 per cent. It seems to us that in many cases the gas companies must have been unjustly fined for failing to keep the illuminating power of their gas up to the requisite standard. The results given prove that on damp days the illuminating power of gas is much less than on dry days, and that the lower the barometer the less is the illumination produced by a flame. No hint is given in the paper as to how the pressure of the carbon dioxide present in the air was determined. In the subsequent discussion, Professor Ayrton raised the question of the sudden and apparently unaccountable variations in the light that is sent out by electric glow lamps. These variations, as a rule, are very small, and experimenters have probably often put them down to the unavoidable errors of experiment. We have evidence that these irregularities do occur in some lamps, but they are only of theoretical interest, as they are rarely appreciable. They are possibly due to the carbon filament being badly fastened to the platinum wires.

The Screen at the Admiralty, Whitehall.

IT was officially announced in the House of Commons at the close of the Session that the First Commissioner of Works has under his consideration the removal of the wooden shutters from the screen in front of the Admiralty court-yard. The shutters—they are in fact sliding doors—were put up after the screen had been altered for the making of the two rectangular gateways. Robert Adam's plans and designs, 1760, show a continuous wall behind five disengaged columns in each half of the screen. That the screen was so built as Adam intended, with the two blocking walls, is clearly proved by an examination we have made of his large architectural drawing of 1760, of I. Cunego's plate, 1775, contained in Part IV. of "The Works in Architecture of Robert and James Adam, Esquires," three volumes, folio, 1773-1822, and of the prints by T. Malton and by Medland, after Miller, of 1795 and 1796. In or about 1827, when G. L. Taylor was Surveyor of Naval Buildings, etc., the design of the screen was mutilated, at the instance, it is said, of the Duke of Clarence (William IV.), by the insertion of a carriage gateway in each half of the screen and the removal of the middle column, the whole number of columns being thus reduced from ten to eight. Shepherd's drawing of that time shows the altered screen, but he delineates a blocked parapet between the piers of the original arched gateway, at the middle point of the screen, instead of the existing balustrade; the balustrade is depicted in the XVIIIth. century views, and does not appear to have been changed. We may mention that, in a letter printed in our columns of October 12, 1895, Mr. E. W. Hudson cites a sketch by Taylor of the altered façade, "showing . . . . a *cast-iron* lintel replacing the stone entablature"; and that Adam built the former gateway and pavilions at the south end of the screen as an entrance into the house of the Earl of Kinnoul.

Parish Church, Greenwich.

A STRUCTURAL renovation of the entire exterior of the parish church of St. Alphege, Greenwich, is about to be carried out under the superintendence of Messrs. Thomas Dinwiddy and Sons. The church was built in 1711-8 upon the supposed site of the death of St. Alphege, archbishop and martyr. It is distinguished by some fine woodwork and an elaborate altar-piece having fluted Corinthian columns on its three sides, supporting an entablature planned triangle-wise. The tower (1730) was designed by John James, to whom also is ascribed the body of the fabric, though by one account that portion is the work of Hawksmoor. In the former church was buried Thomas Tallis, the composer, who died in 1585; the present church contains a monument to John J. Angerstein, whose collection of pictures formed the nucleus of our National Gallery, and who lived in the neighbourhood; and a monument to General Wolfe, whose remains were brought thither from Quebec for interment in his father's grave. In the old church was set up a portrait on glass of Humphrey Duke of Gloucester, and amongst the brasses was one in memory of Tallis and his wife Joan, bearing a quaint epitaph recording his career in the reigns of Henry VIII. and his three successors on the throne. A rare print, lettered "designed by N. Hawksmoor, A.D. 1714," shows the former tower—since rebuilt by James—which escaped when the older church fell down. In the north aisle was buried Robert Adams, with an inscription, "Egregio viro Roberto Adams, operum regiorum Supervisori, architecturæ peritissimo, ob. 1595."

Stratford-place, Oxford-street.

IN a "Note" in our columns of January 22, 1898, we directed attention to the spoiling of the continuous design of the houses in Stratford-place by the raising of a house (No. 6) on the east side, with a consequent breaking through of the range of the cornice and balustrade. We notice that scaffolding is erected in front of a house, No. 17, on the west side, and that the roof has been removed for a similar alteration of the façade on that side. The street, with the mansion at its further end, is now seen to greater advantage from the recently widened end of Davies-street, and affords a handsome prospect from the latter thoroughfare. We may add that Stratford-place was laid out in the Mill Hill Field of the Conduit Mead estate, the property of the Corporation of the City of London, who granted a ground lease to Edward Stratford, whose son John was created Earl of Aldborough on July 9, 1777. The houses on the two sides and Aldborough House, at the north end, were built in or about 1774, by Robert Adam, and constituted a self-contained example of his style upon a large scale, until the destruction, twelve years ago, of No. 1, at the south-east corner, upon the removal of the Portland Club to St. James's-square.

No 32, Cavendish-square, W.

THERE is now being pulled down a house which is associated with the careers and works of three eminent English portrait painters. The house, now numbered 32, stands on the south side of Cavendish-square, and having been suffered to fall into disrepair, is to be rebuilt. Constructed of red brick, it is one of the original houses erected on that side of the square. The square was at first laid out, as Oxford-square, on the Harley, now Lord Howard de Walden's, estate in 1717-18; though building operations were delayed for a while by the failure of the South Sea speculation. The house was occupied, until his death in 1770, by Francis Cotes, R.A., famed for his portraits in oils and crayons, who built and decorated the studio, an apartment some 18 ft. square on plan. To Cotes succeeded, during the interval 1775-1794, George Romney, to whom Sir Joshua Reynolds would refer as "the man in Cavendish-square." After Romney's retirement to Holly Bush-hill, Hampstead, the house was taken by Sir Martin Archer Shee, P.R.A., in 1798, the year of his election as an Associate Member of the Royal Academy.

THE BALTIMORE FIRE.*

The Baltimore Fire is one of, if not the most interesting fire, of recent years, for although it has redemonstrated many facts with which we were already acquainted, it has furnished us for the first time with a most thorough and complete example of the behaviour of the modern steel framed building under a severe fire test; it has also shown the weak points in these structures and where greater fire-resistance may be effected in the future.

It has re-demonstrated that all forms of stone are bad fire-resistants, and should be but sparingly used in the structure of town buildings. It would of course be impossible to abolish it altogether from an architectural point of view, but where used it should be well backed with brickwork, so that any renewal may be effected without danger to the structures. Indeed, this fire has clearly proved that the only reliable materials are brick and concrete. The hollow tile floor construction and encasing to iron-work of which we have heard so much in certain quarters has largely failed, and would have failed to a greater extent had the fire been less extensive in area and the fire brigade had been enabled to put water upon this material, for it is to be remembered that the water test was absent, and we have only the result of intense heat without the sudden cooling.

It may be a cause of general satisfaction that at last a system of construction has been devised whereby the general fabrics may, after a serious conflagration, remain standing, but it is very little consolation to the individual occupier when he can at last return to the scene of his former labours to find that all that remains of his office equipment, in a building which at the outset he was assured was fireproof, is the conglomerate remains of a typewriter and a battered iron safe.

It seems to have been overlooked by the designers of these buildings that there was just as much danger from the outside as from within, and perhaps more so, and no provision, or at any rate very inadequate provision was made for an attack from fire from the exterior.

I am quite convinced that had these tall buildings been more adequately equipped with safeguards from without they would have survived the fire, not as a mere constructional shell as we see them to-day, but with more of their internal trim and contents saved from the devouring element.

Beyond I think in one case where external sprinklers were used at O'Neill and Co.'s store with marked effect. Wired glass seems to have resisted the ingress of the flames in a marked degree in the buildings where it was used, and has proved itself worthy of more general adoption, but it requires to be fitted into metal frames, and I think very useful experimental work could with advantage be conducted with this material to ascertain the best method of fixing, and also whether double thickness either in the same frame or an inner frame would be more effective. In the paper read at the Fire Prevention Congress at London in 1903, on the new Entropôt Royal in Antwerp, the method of fixing adopted there was illustrated on page 58 in a paper read by Chief Officer A. Schepers.

I am not so sure that wired glass is the best material that will eventually be adopted for this purpose of "exposure risk," but it appears to me to be the best material now available; what we require is a transparent material with a higher melting-point than ordinary glass, and it is for manufacturers who see the want to supply the need. This fire has clearly shown that the town building owner must not be allowed to construct his building in the cheapest and flimsiest manner, trusting to the efficiency of the fire brigade to protect him from his neighbour, or *vice versâ*. It has again been demonstrated that however efficient the equipment and however devoted the personnel of the brigade may be (and I should like to take this opportunity of expressing my admiration for the fire fighting force on that occasion), with a high wind and the fire spreading in three or four directions at the same time, the task of extinguishing is superhuman. The building owner should by his construction assist the brigade to keep a fire at the outset within reasonable limits, or to retard its progress by sound fire-resisting construction. I have carefully examined the plan of the burnt area at Baltimore, and it appears to me that the building regulations want revision so as to limit the cubical contents of buildings. From a rough calculation I find that the cubic contents of the "Hurst" building, where the fire started, was between 700,000 and 800,000 cubic ft. (20,000 and 22,857 cubic metres), and when a building of this cubical extent becomes well alight its extinction without adjoining damage is a matter of great difficulty. What is wanted is a limit to the cubical extent, and any building of the warehouse or store class should be divided into compartments by vertical walls, and any communication between each compartment should be by double iron doors properly secured. I cannot help thinking that we in London have been saved from these disastrous fires by this means; we have on some occasions had similar conditions, *viz.*, a fire in a crowded district with a high wind, but although considerable damage has been done, the fire has been stopped mainly by the vertical walls dividing up the buildings. The London Building Act limits the cubical contents of buildings of the warehouse class to 250,000 cubic ft. (7,142 cubic metres). It would, I think, be a great advantage in buildings of this class that all roofs be flat and of fire-resisting material. A flat roof is a great advantage to the fire fighting force. Reverting to the material of which fire-resisting floors and roofs are made, I have great faith in coke breeze or cinder concrete when properly mixed and reinforced with iron, and also as a protection to ironwork generally. My faith is from actual experience, which this Baltimore fire corroborates. We have at our testing-station the roof of one of our huts constructed of this material, and although beneath it we have conducted a number of tests, some of one, two, three, and four hours duration with a temperature gradually increasing to 2,000 deg., this roof is practically as good as the day it was erected. Hollow tile has shown its deficiencies, but concrete has yet to be defeated. One word as to staircases and lifts. All well-holes around such should be encased in brick, and all doors on to same should be made to close automatically, and the top should terminate in a light glass roof, easily broken in case of fire, and thus a shaft would be formed for the escape of smoke and flame, which would thus be prevented from penetrating other portions of the structure.

Thanking you, gentlemen, for so patiently listening to my remarks, I have to thank the reader of the former paper for the information contained therein.

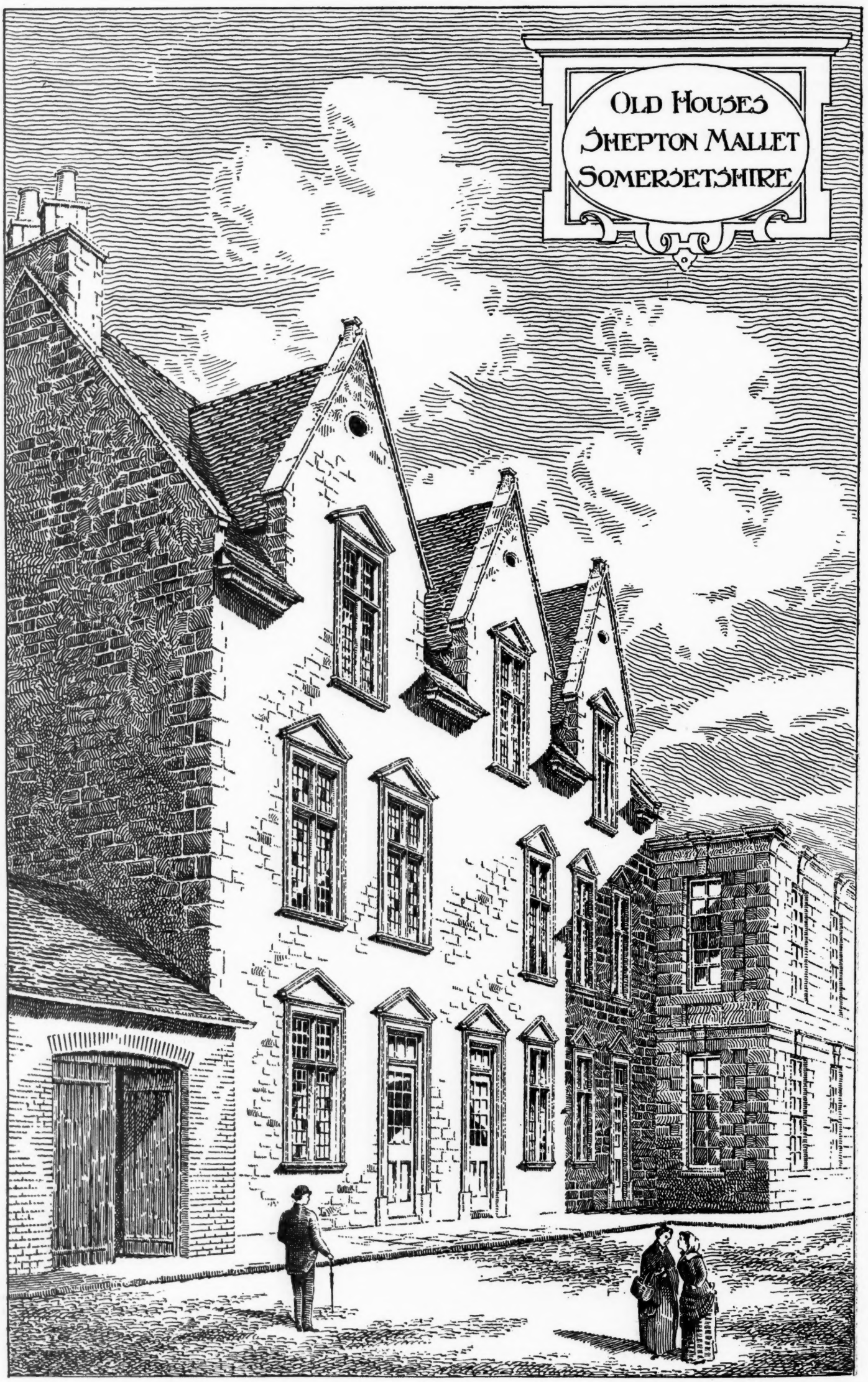
* A paper read at the Budapest Fire Congress, August, 1904, by Mr. Ellis Marsland, District Surveyor, London; Gen. Hon. Secretary to the British Fire Prevention Committee.

UNION OF BENEFICES, LONDON, AND HOLY TRINITY, MINORIES.

ORDERS in Council have been made for ratifying many schemes recently prepared by the Ecclesiastical Commissioners. Two of the schemes relate to the churches of St. Saviour, in London-street, Fitzroy-square, and Holy Trinity, in the Minories. In the former case the benefices of St. John the Evangelist, Charlotte-street, and St. Saviour will be united, and the Church of St. Saviour will be converted for a Sunday School or other purposes, and the proceeds of the sale of the parsonage-house are to be applied towards the provision of a parsonage-house for St. George's, Enfield. St. Saviour's was built of brick, as Fitzroy Chapel, after designs by the brothers Adam, at the time when they laid out Fitzroy-square, of which they completed the east and south sides in 1792-4, and, having been altered for 1,000 seats by J. Peacock, was consecrated and re-opened in July, 1864. The union of the benefices of Holy Trinity, Minories, with St. Botolph, Aldgate, having been effected, the residue of the endowments of the former benefice are to be allocated to the incumbent of St. Mary, Stratford-by-Bow. Holy Trinity Church, at the east end of Church-street, formerly Little Minories, was built in 1706 to replace the Minory House chapel of the parish, about 5 acres in extent, and one of the Tower Liberties, that had been constituted out of the close and precincts of St. Mary's Abbey. That convent of Franciscan nuns was founded in 1293 for Poor Clares, or *Sorores Minores*, by Edmund, Earl of Lancaster, surnamed Crouch-back, and his second wife, Blanche, Queen of Navarre. Fragments of the abbey buildings have been found in the front, since modernised, of Haydon House, and after the fire of two or three weeks ago, in the north wall of the church, which was closed in January, 1899, and converted into a mission-room. After the surrender by Dame Elizabeth Salvage, last titular abbess, the property was granted to John Clerke, Bishop of Bath and Wells, the precincts became a colony of metal-founders and gunsmiths, and around the fountain was built Haydon-square, so named after Sir John Heydon, Lieutenant of the Ordnance. In the old church Edward I. deposited the heart of his mother, Queen Eleanor of Provence; the interments comprise those of Bishop Clerke, and some Scotsmen who fought on Drummossie Moor, Culloden—an adjacent public-house in the Minories has the sign of "The Three Lords"—Edmund de la Pole, Earl of Suffolk, his wife, and their daughter, a nun of St. Clare. A relic used to be shown at Holy Trinity as the head of Lady Jane Grey's father, the Duke of Suffolk, who held the Minory House by grant from Edward VI., but there is reason to believe that the head belonged to Edmund de la Pole, Earl of Suffolk, whom Henry VIII. decapitated in 1513. The registers record the burials of Cornelius Dribbel, a Dutchman, "his Mat^le^ chief Ingeneere" (October 16, 1633), who should share with Fontana the credit of inventing the microscope, and (1670) Colonel William Legge, King Charles I.'s faithful servant, who received a grant of the Minory, rebuilt as the King's, House, from Charles II., and was Lieutenant of the Ordnance. His descendants, the Earls of Dartmouth, had a right to sepulture in the vault under the chancel. The inscription on the marble monument gives, wrongly, the date of his death as "1672." Sir Philip Sidney's body lay in state in the church, and was carried thence by the Grocers' Company to St. Paul's.

GLASGOW.—Mr. Roscoe Mullins's fine group of Isaac and Esau:—"Bless me even me also O my Father," which has been exhibited twice at the Royal Academy, in plaster in 1884, and in marble during the present year, is at present on view at the Sculpture Gallery, Kelvin-grove, Glasgow, where it will remain for twelve months.

PROPOSED COTTAGE HOSPITAL, MOFFAT.—The directors of the proposed cottage hospital at Moffat decided, some weeks ago, to approve of the plans prepared by Mr. H. W. Walker, architect, Edinburgh, and instructions were given to prepare working plans. In the interval some opposition has arisen to the adoption of the plans, and objection was taken to restricting the competition to two architects. At a subsequent meeting of the directors the plans referred to were disapproved of, and it was resolved to invite competitive designs.


OLD HOUSES
SHEPTON MALLET
SOMERSETSHIRE

OLD HOUSES, SHEPTON MALLET.

SHEPTON MALLET, which is about 5 miles from Wells, is a quaint old town. The chief interest to the architect lies in the church and market cross, both of which are well known; but there are several good examples of domestic work, the best being the houses shown in the accompanying sketch. They are in an excellent state of preservation and form, with their red-tiled roofs and steep-pitched gables; a picturesque group, but being situated in a very narrow street, some distance from the main road, are little seen. W. EATON.

Books.

Pioneer Irrigation: a Manual of Information for Farmers in the Colonies. By E. O. MAWSON, M.Inst.C.E., Executive Officer, Public Works Department, Bombay. With Additional Chapters on Light Railways, by E. R. CALTHROP, M.Inst.C.E., M.I.Mech.E. Illustrated by numerous plates and diagrams. London: Crosby Lockwood and Son. 1904.

As THE title-page indicates, this book was written with the object of affording information to pioneer settlers on the subject of irrigation. The additional chapters on light railways may seem to be a little out of place, and perhaps might be more suitably presented in an extended form as a separate volume under the title of "Pioneer Railways." It is the fact, however, that irrigation and railways should go hand in hand whenever practicable, and for this reason those who are occupied in the development of land in new countries will find the inclusion of the second subject both helpful and convenient. Chapters I. to IV. contain detailed instruction upon various preliminary works connected with the supply of water, and, speaking generally, only such undertakings are suggested as can be constructed by an intelligent and resourceful man unable to command professional advice and skilled labour. In Chapter I. the author adduces some striking figures in proof of the value of irrigation. For example, he states that in South Africa the selling price of irrigable land not provided with water varies from 3*s.* to 3*l.* per acre, while when provided with perennial irrigation it is worth from 20*l.* to 100*l.* per acre. Again, we are told that the fruit lands of Arizona and California are almost valueless until they are watered, after which they become worth 50*l.* to 60*l.* per acre, while groves in good positions with first-class water rights are valued at 200*l.* to 300*l.* per acre. Similarly profitable results are quoted with respect to India and Egypt, the pioneer countries of irrigation. In America this department of engineering has developed very much during recent years, and in South Africa the Government and the agricultural classes are at last beginning to think seriously of operations on a large scale. In Australia there are immense tracts of land, now subject to permanent or intermittent drought, and through which the rivers are allowed to carry away great volumes of flood water, that would be worth their weight in gold if intelligently stored and utilised. Untold misery has been suffered, and is still suffered, in some parts of Australia by neglect of irrigation works, and we are pleased to think that Mr. Mawson's work may have the effect of awakening many owners and occupiers of land to a sense of their obvious duty in this direction.

Having disposed of preliminaries, the author explains the construction of dams and weirs in Chapter II. Settlers in new countries generally make a point of choosing their homes near watercourses, and in any such situation the storage of water can be effected at comparatively small expense by the building of a weir, or preferably of a dam to form a reservoir. In the latter case an overflow weir must be provided to permit the escape of surplus flood water. With the proviso that no dam higher than 10 ft. above the bed of the stream should be built without professional advice, the author details the methods of construction suitable for adoption by pioneer farmers, giving sections of masonry, rock-filled, earthen and timber dams. Similar treatment is pursued in the case of weirs, and a full account is given of "automatic weirs," the usefulness of which depends on the rapid and certain opening of the sluice gates, which form the movable crest, when the river is in flood. Simple directions are also given for the construction of head gates, or regulators, for controlling the supplies of water to irrigation canals, and for preventing the flood waters of a river from entering such channels and thereby causing injury to the banks. We may here observe that several views of dams and weirs illustrating this chapter represent undertakings of far too ambitious character for execution by settlers having no technical knowledge or experience, but this reservation must not be taken as applying to the more simple works, the construction of which is so lucidly explained by the author. The construction of irrigation channels, flumes, iron trough and pipe aqueducts should offer no great difficulty to the man who is accustomed to work upon land, and by following the rules given in Chapter III. the intelligent cultivator ought to be able to provide adequate means for the distribution of water stored in his reservoir or held up in the bed of the stream passing through his lands. Recognising the fact that sources of water supply are not always to be found on the surface, the author wisely devotes a chapter to "Underground Water," pointing out the value of wells, horizontal bores, and open galleries. The hints offered with regard to the first of these classes of work cover matter that is fairly well known, but the description of the methods to be adopted in making horizontal bores and open galleries will probably be found less familiar to many readers. It is pointed out that the most economical means of raising water from wells is by windmill pumps, which are very largely employed for irrigating fruit gardens in America, and, we may add, are now becoming general in this and other countries. Other types of pumping machinery are discussed in the same chapter, but as most of these involve the use of animal or steam power they are naturally to be avoided wherever possible. We now arrive at one of the most useful chapters in the manual. This, entitled "Methods of Irrigation," contains much excellent advice which the experience of the author thoroughly qualifies him to impart. The practical success of every method essentially depends upon knowledge. On this point we cannot do better than to quote the words of the author:—"The knowledge of the best way of applying water to the crop, and the amount necessary, forms one of the most important factors upon which depends success in irrigation operations. . . . Both the crop and soil must, therefore, be considered when determining the amount of water to be used in each case, and the exact quantity required can only be determined by experience. Until this experience has been gained there is a strong tendency to use too much water. This is the greatest mistake, and it is better to use too little water than too much." After further advice of this character Mr. Mawson describes and illustrates different methods of distributing water, and concludes the chapter with a reference to "Inundation Irrigation," and the conditions under which it may usefully be adopted. Passing over a short chapter on "Sewage Irrigation," which is a subject scarcely likely to interest pioneer settlers, attention will be briefly directed to the subject of "Automatic Sluice Gates," considered in Chapter VII. Apparatus of this kind is so constructed that as the volume of the flood increases or diminishes the sluice gates adjust themselves automatically to the flow, opening and closing in proportion as the volume of flood water increases or diminishes. With non-automatic gates there is always the risk that those whose duty it is to open the gates may neglect to do so in case of flood, and the attention of all cultivators of land may well be called to the type of apparatus fully described in this chapter. Mr. Mawson next devotes himself to the discussion of cultivation as applied to cereals, vegetables, and fruit trees, which, although a most important branch of work, does not here require more than passing mention.

With regard to "Light Railways," forming the subject matter of Chapters IX. and X., it may be said that such works are only second in importance to water supplies in the development of new countries, for they afford means by which agricultural products are greatly increased in value. It is scarcely to be expected that settlers will be able to build and equip even light railways without professional assistance, and undertakings of this kind clearly demand co-operation between the chief occupants of land along the proposed route and the inhabitants of the objective market or markets. Mr. Calthrop, the author of the two chapters here in question, has had considerable experience in connexion with the design of light railways, and the information he now gives should be sufficient to enable the layman to appreciate the essential features of such means of transport, and to obtain a good idea of the most suitable types of rolling-stock for employment under different conditions.

In conclusion, we may say that throughout the volume the subjects selected are satisfactorily discussed in simple language perfectly intelligible to the non-technical reader. Mr. Mawson has succeeded in demonstrating how available water supplies can be applied to the irrigation of crops by means of comparatively inexpensive works quite within the reach of the class to whom his work is addressed, and Mr. Calthrop has conveyed in a similar manner much useful information with regard to railway transport. The numerous diagrams and other illustrations add greatly to the value of a work which will be read with profit and pleasure by those who are interested in the development of lands in arid and semi-arid regions.

Transactions of the Institution of Civil Engineers of Ireland (*69th Session, to May,* 1903). Vol. XXX. Dublin: Printed for the Institution by JOHN FALCONER. 1904.

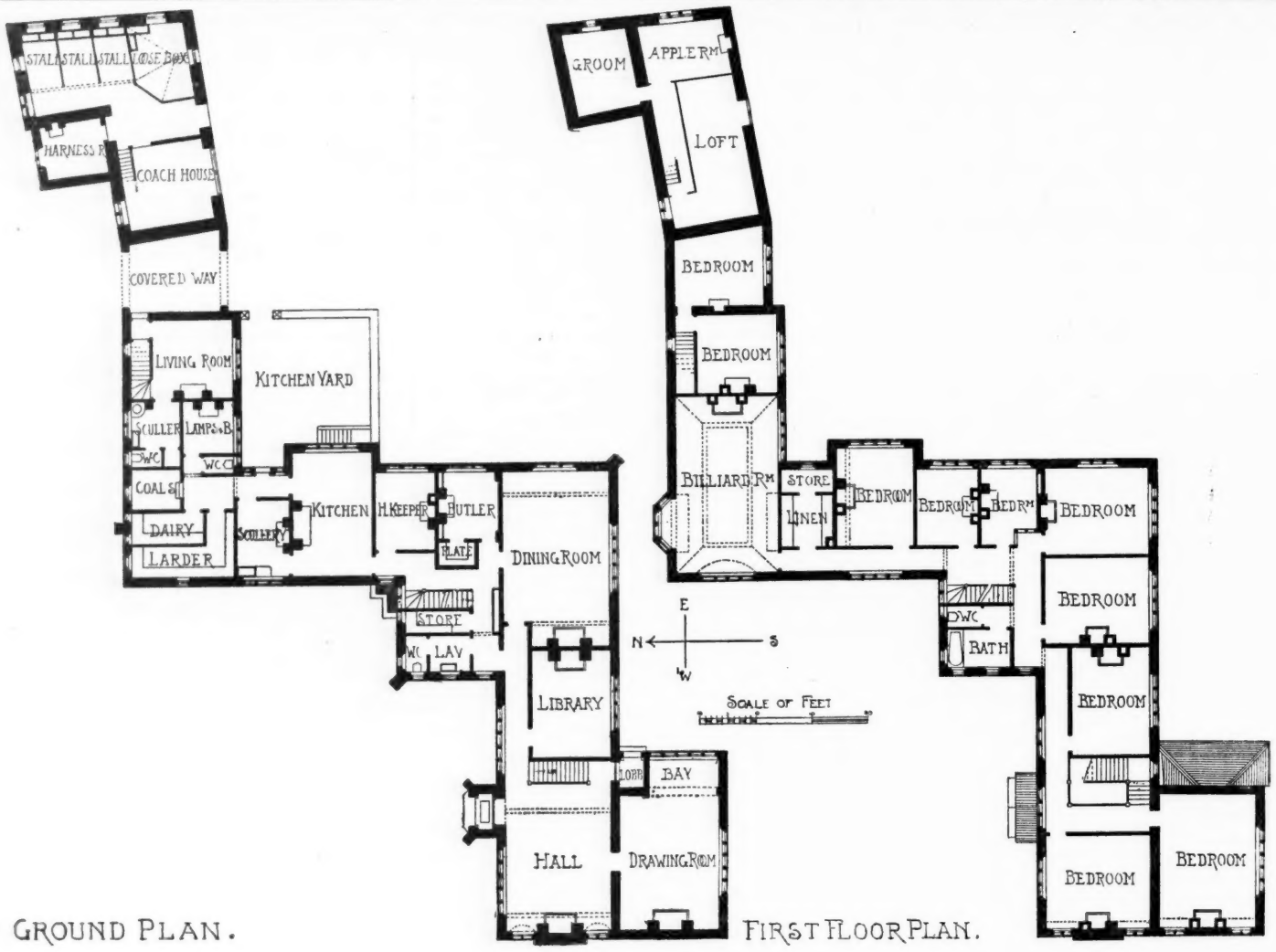
ALL the papers reprinted in the present volume of transactions are of marked interest. Mr. Mark Ruddle deals with the electrical transmission and transformation of energy, a rival to old-fashioned methods so convenient and efficient that it already bids fair to oust its older competitors from many fields of work. The author devotes attention more particularly to the application of electricity to motive power in workshops and factories. An exhaustive paper on "The Destruction of Town's Refuse," by Mr. H. Norman Leask, will well repay careful study, and "Some Notes on Route Surveys with the Plane Table in Egypt," by Mr. J. T. Trevor Dillon should be read by surveyors who contemplate going abroad, as it contains many practical hints that are seldom conveyed in text books or courses of lectures. Mr. W. E. Lilly, discusses "The Design of Plate Girders," pointing out that the rough and ready rules now in use and based on hypothetical conditions, lead to excess of material in the web of such members. The treatment as put forward in this paper differs considerably from that generally given in engineering treatises, and a method proposed by the author of treating the web section as divided into two parts for the purpose of calculation is quite new, and worthy of examination. Some points of great importance are raised in the instructive paper by Mr. Allanson-Winn, on "The Youghal Foreshore Protection Works; and Deep Sea Erosion on the East Coast of England." The author says:—"Local authorities too often consider only what they can see—falling cliffs, wasting beach, and broken-down walls, groynes, etc., for which they have paid heavily. They do not realise that the trouble is brought about mainly by the advance of deep water, and even when this is fully explained and proved they exhibit a tendency to ignore the facts because they are unpleasant ones." Mr. Allanson-Winn has devoted much time to the question of deep sea erosion, and the aspect of the foreshore protection problem which he here puts forward is distinctly novel, and demands at least the most searching investigation.

Builders' Hoisting Machinery, with Numerous Illustrations. Edited by PAUL N. HASLUCK. London: Cassell and Company. 1904.

AMONG the contents of this little handbook the mechanic or builder's foreman will find many items of useful information, conveyed in simple language and in a manner likely to be appreciated by all practical men. Simple lifting tackle, winches, crabs, and cranes of various types are described, and their details of construction discussed. In the last chapter the reader will find a brief but complete account of the different methods by which motive power is applied to the operation of hoisting machinery. The handbook comprises some eighty-three illustrations and a well-prepared index. It is an excellent manual for those desiring general, and more or less elementary, information upon the subject discussed.

Particulars of Docks, Wharves, etc., on the Thames. Compiled by CHAS. H. JORDAN, M.I.N.A. Second edition. London: E. and F. N. Spon. 1904.

THIS is a useful small publication giving in tabular form the particulars of docks and wharves on the Thames. Those of the docks



GROUND PLAN. FIRST FLOOR PLAN.

Winsley House, Wilts.

give measurements, with the names of the proprietors and other particulars. The list of wharves gives name, situation, and proprietor's name. There is also a good series of maps of the reaches of the Thames below bridge, with the docks and the places situated on the banks. The whole is very well and carefully done.

BOOKS RECEIVED.

How to Collect Old Furniture. By Frederick Litchfield. (Geo. Bell and Sons.)

Illustrations.

NEW ROOF, MAGDALEN COLLEGE HALL, OXFORD.

THE new roof, shown in the illustration, replaces a poor plaster one of comparatively modern date, and incongruous character. The old stone corbels only remained, and signs of the pitch of the original roof were alone visible.

The roof is of English oak throughout and is covered with lead. The window in the eastern end of the hall had been walled up. It was found to be much injured, and it has been made good to what was probably the old design, and has been filled with good heraldic stained glass. A new fireplace has been put in the hall. The roof has been carried out by Messrs. Rattee and Kett, of Cambridge, from the design of Mr. G. F. Bodley, R.A.

WINSLEY HOUSE, WILTS.

This house has been erected upon the site of an old house, and is built entirely of stone quarried upon the site, the roof being covered with old stone tiles collected in the neighbourhood.

The plan is of a somewhat unusual form, and was determined by attempting in the first instance to alter and add to the existing house; the old work was, however, found to be in such a bad condition, that it became necessary to entirely rebuild, the lines of the original plan being retained.

The ground floor contains a large hall, drawing-room and library, in addition to a kitchen and offices. The first floor has eight bedrooms and a large billiard room with an oriel window, and there are seven bedrooms on the second floor.

The contractors were Messrs. J. Long and Sons, and the clerk of the works, Mr. E. J. Trotman; the architects being Mr. T. B. Silcock and Mr. S. S. Reay, of Bath and London.

The two views now published were hung in this year's Royal Academy Exhibition.

CHURCH OF S. CHAD, LONGSDON, STAFFORDSHIRE.

This church is being erected at Longsdon, near Leek. The foundation stone was laid by the Bishop of Shrewsbury in October last. The church consists of a nave, north aisle, chancel, priests' and choir vestries, and will accommodate about 350 people. Ladderedge stone is used for the walling, and Red Alton and Roches stone for the windows, piers, quoins, and other dressings.

The general contractors are Messrs. Thomas and Henry Grace, of Leek. The architect is Mr. Gerald C. Horsley.

CONGREGATIONAL CHURCH, DOVER.

This church is built to accommodate the congregations of two smaller ones in the town. In accordance with the wishes of the Committee it is designed in the Gothic style of the XIVth century (treated in a somewhat free manner).

The walls are of Kentish rag with freestone dressings. The roofs are covered with local tiles. The woodwork generally inside is pitch pine. The seating, supplied by Bennetts, is of oram. The heating apparatus by Grundy, and the electric lighting by Wright and Sons, of Dover.

The site being very cramped, and seating accommodation required for 650, nearly the whole area is covered by the building; the windows in the side walls are, therefore, liable to be interfered with by adjoining owners. In order to obtain light that cannot be so obstructed, a large window is placed in the east wall facing the street, and a sort of clerestory of wood formed in the roof; the principals are carried to the side walls, and are cased and rough cast outside, showing above flat as a kind of buttress.

The cost will be under 7,000*l.*, exclusive of site.

Messrs. R. and G. Brisley, of Dover, are the builders, and Messrs. Cresswell and Newman and Beeston, also of Dover, the architects.

The drawing was exhibited at the Royal Academy this year, under the name of Mr. F. Newman only, as in the title on the plate.

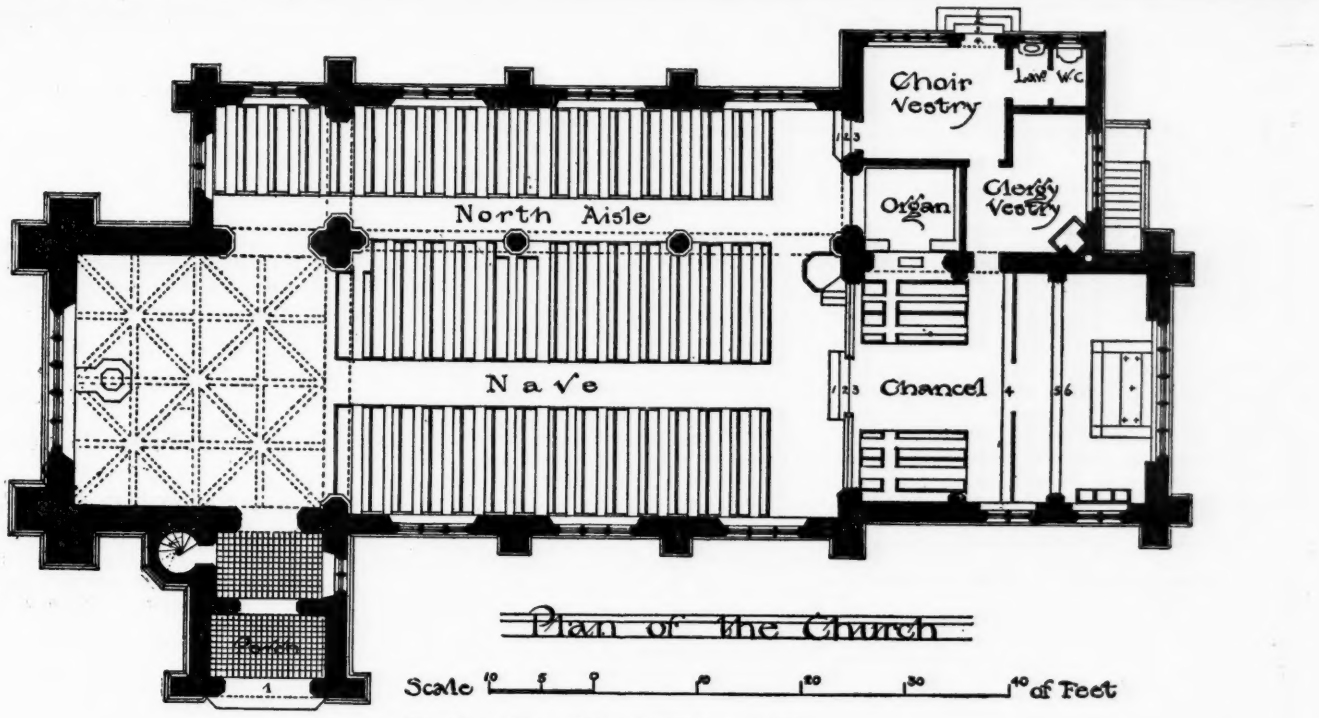
DINING-ROOM, DALTON HILL, ALBURY.

This is a dining-room which formed part of some additions to Dalton Hill, Albury.

The work was carried out by Messrs. Mitchell and Sons, of Shalford, Guildford. The joiners' work is in fumigated oak; the windows are lead-glazed casements set in the stonework. Mr. Evelyn Hellicar was the architect.

AYLESFORD BRIDGE AND PRIORY.

The illustrations of Aylesford Bridge and of the portion of the ancient priory now known as "The Friars," are from photographs, for which we are indebted to Mr. Clinch, of the Society of Antiquaries. Aylesford Bridge is the only one that spans the river Medway between Maidstone and Rochester. It was built in the XIVth century, and though two of its arches have been made into one to meet the demands of later traffic, it presents in general appearance a likeness to the co-eval bridge across the river at Farleigh, about three miles above Maidstone. It was originally built at the ford on the British road, latterly known as the Pilgrims' "Way," along which tin ingots were carried from the west of Britain to Rutupiæ or Sandwich haven. One can follow to-day the ancient, but now deserted, road, which, as lately as the middle of the XVIth century, was known as the "King's Highway," from Westerham to Shoreham (in Kent). Skirting the forest of Anderida and traversing



Church of St. Chad, Longsdon. Plan.

Hampshire and Surrey, it marches with the range of chalk hills which extend through Kent from Eynesford to Hythe. The road enters Kent near Titsey in Surrey, close to Westerham, pursues its course to Chevening, thence across the valley of the Darenth to Otford, along the southern slopes of North Downs to the Medway valley, and so through Aylesford to Boxley, Hollingbourne, and Charing. The grass-grown track is marked by the yew trees planted along its sides, as well as by several British earthworks and remains of the Roman occupation in its immediate vicinity. Before the main road was made through Maidstone the pilgrims passed through Aylesford on their way from Southampton and the south-western ports to the martyrs' shrine at Canterbury. The ford is commemorated in the name of the town, the Saxon Æglesford, and the Elesford of the Domesday Survey, wherein some discern the name of Eigil, the renowned archer.

The question as to the proposed removal of the bridge, and its picturesque value, is considered on another page.

The Student's Column.

NOTES ON PORTLAND CEMENT.

CHAPTER VIII. (*Continued*).

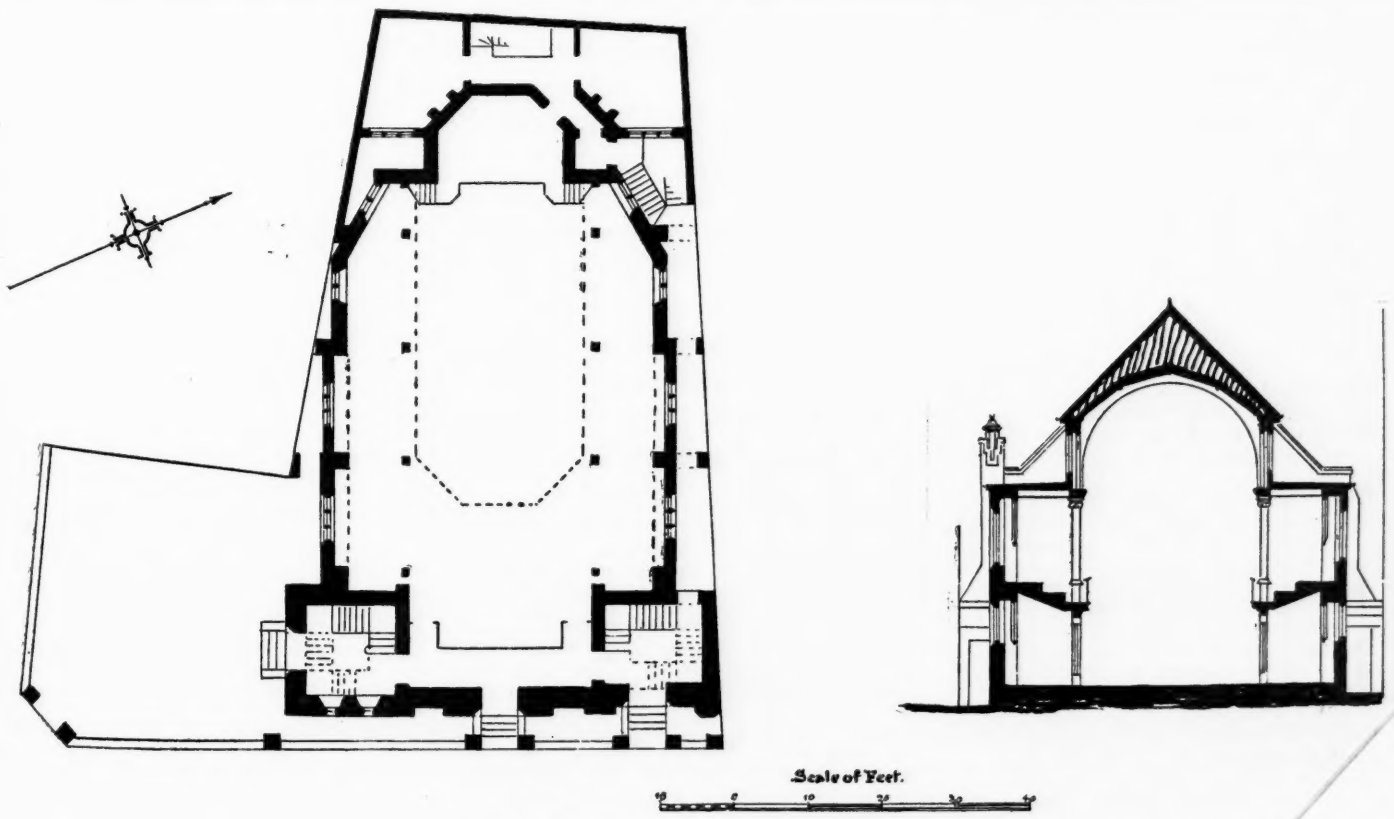
WHEN cement is mixed with a certain amount of water a plastic paste is formed which stiffens after a time and then hardens so as to resist slight pressure. Accepting Le Chatelier's theory of supersaturation, the time which elapses from the addition of the water till supersaturation takes place is the "initial set." When the cement cake resists a certain pressure it is said to be "hard set."

There are a number of methods of determining these points, none of which are entirely satisfactory, but the most generally adopted method is to bring a weighted needle of a certain section down gently on the cake. When it fails to penetrate to the bottom the "initial set" is said to have taken place; when it leaves no visible impression on the surface the cement is "hard set." With quick-setting cement the "initial set" is clearly defined owing to rapid crystallisation; with slow-setting varieties the change is often so gradual that the point is not absolutely definable. The *modus operandi* is as follows:—

The cement is mixed with just sufficient water that after thorough mixing, so that all the particles become wetted, a stiff paste is obtained. This is spread on a clean glass plate into a cake about $\frac{1}{2}$ in. thick, and tried from time to time with the needle till it is found to be set.

There are so many causes influencing the results obtained, and unfortunately in most specifications no particulars are given regarding the method in which the test will be carried out. With any sample of cement the same tester can obtain vastly varying results according to the method of manipulation, and a much wider range of results may be obtained when tested by different operators.

Some of the causes which influence the results are the character of the water, the amount of water used in gauging, the



Congregational Church, Dover. Plan and Section.

TABLE I.

	Method of Treatment. 20 per cent. Water to Gauge in each Test.	Time Mixing.	Temperature ° F.	Setting Time. Initial. Mins.	Final. Hours.	Final. Mins.
1	Mixed quickly, with no particular care	½	63	3¼	—	8
2	Mixed quickly, with no particular care	1	63	6½	—	24
3	Mixed carefully: gave well-finished pat	1½	63	8½	—	30
4	Mixed carefully: gave well-finished pat	2½	63	10	1	43
5	Mixing needlessly prolonged and occasionally left at rest	5	62	8	—	35
6	Same as 5, but mixing all the time	5	62	13	—	38

temperature of water and air, the method of mixing, and the time taken for manipulation.

The results of experiments by the author to see what effect lengthening the time of mixing had on the setting time are given in Table I. The effect of different proportions of water is shown in Table II. The author has found that

TABLE II.

Temperature ° F.	Setting Time when Gauged with 20 per cent. of Water. Initial. Mins.	Final. Hours.	Final. Mins.	Setting Time when Gauged with 25 per cent. of Water. Initial. Mins.	Final. Hours.	Final. Mins.
68	12	1	—	20	1	10
68	5	—	24	11	1	47
67	8	—	20	13	1	46
64	14	2	7	72	2	37
69	5	—	46	16	2	34
58	24	3	—	45	3	15
68	12	—	53	34	2	23
66	8	1	7	24	2	5
59	9	—	50	38	3	20
60	36	4	24	129	4	50

when the mixing with water is done in a large porcelain mortar—that is, very efficient mixing—the setting time is much longer than when mixed with a trowel. The higher the temperature the quicker will setting take place, the chemical action being more energetic.

As the setting depends on the hydration of the compounds, the cement cake must not be allowed to dry, so should be protected from currents of air and from the heat of the sun. Especially between the temperatures of 40° and 60° Fahr. is the influence of temperature seen on the setting of cement, and it is very noticeable in testing that a difference of three or four degrees has a marked effect on the setting time.

TABLE III.

Temperature ° F.	Setting Time when Gauged with 25 per cent. Water. Initial. Minutes.	Final. Hours.	Final. Minutes.	Temperature ° F.	Setting Time when Gauged with 25 per cent. Water. Initial. Minutes.	Final. Hours.	Final. Minutes.
57	15	—	50	48	34	4	—
59	12	2	—	55	17	3	30
65	26	2	10	46	55	3	—
61	46	2	—	53	110	5	—
57	30	2	—	50	50	3	50
70	18	2	10	65	60	4	55
65	5	1	30	63	9	2	10
60	135	4	43	55	213	8	—
65	50	1	47	48	122	10	—
59	21	1	13	53	43	4	10

Assuming Le Chatelier's theory of supersaturation, it is evident that the more water is added to a cement the slower will its set be, as it will take longer for the water to become saturated.

There are several compounds which, when added to cement, affect its setting. Almost the only one used in practice is sulphate of lime in the form of gypsum, which slows the setting. The German Association of Cement Makers recognise the addition of this compound up to 2 per cent.

Candlot's researches show the effect of gypsum on the setting of cement. His conclusions were:—

(1) The retardation of set caused by the addition of gypsum varies according to the quantity employed.

(2) The action of gypsum is not always permanent, and it often happens that cements slowed by the addition become quicker-setting after aging, and one peculiarity is that they often set more quickly when gauged with sea water than when gauged with fresh water. As pointed out in a previous chapter, Candlot recognised the presence in cement of a double compound of aluminate and sulphate of lime, a compound which he prepared artificially. From this he deduced the following theory:—

"It is well known that aluminate of lime is insoluble in a saturated solution of lime. If sulphate of lime and free lime are present together with aluminate of lime it follows that the combination of the sulphate with the aluminate can take place but very slowly, because the aluminate cannot become hydrated on account of the immediate solution of the lime. In Portland cements there always exists free lime, and this lime by dissolving prevents the hydration of the aluminate; the sulphate of lime, becoming dissolved in turn and not being able to combine with the aluminate, adds its action to that of the lime in annulling the function of the aluminate, and as it is to this salt that setting is attributable when it takes place rapidly, a slow-setting cement results. If the free lime by being sufficiently exposed to air becomes carbonated, at the moment the cement comes into contact with water the lime dissolves less freely, and nothing prevents the solution of the aluminate; the combination with the sulphate of lime can take place, and the sulpho-aluminate formed, as well as the excess of aluminate, by crystallising determine the rapid setting of the cement."

Candlot found in support of this theory that—

(1) A cement mixed with gypsum and slow-setting when gauged with fresh water set quickly when gauged with a weak solution of carbonate of soda (0·2 per cent.).

(2) A cement with gypsum added, and which has become quick-setting through exposure to the air, is rendered very slow-setting by the addition of a little quantity of slaked lime.

COMPETITION.

NEW HEADMASTER'S HOUSE.—In a limited competition for a new house for the headmaster, Upper Latymer Foundation, Hammersmith, the designs prepared jointly by Mr. W. I. Chambers, of Chambers and Martin (London), and Mr. J. H. Brown (Fulham), have been selected by the governors, and the contract, amounting to 1,915*l.*, has been given to Messrs. Frank Harris and Co., of Barnsbury.

EXHIBITION AT VENICE.—The Sixth International Art Exhibition at Venice, under the auspices of the Municipal Council of the City, is to be opened on April 22, 1905, to remain open till October 31 of the same year. It is to include sculpture, painting, drawing, engraving, and decorative art. Notification of the intention to exhibit must be sent not later than January 1, 1905, to the office of the Secretary of the Exhibition, Municipio di Venezia.

TRADE CATALOGUES.

We have received from the Private Wire and Telephone Installation Company, Limited, of 5, Palmer-street, Westminster, a series of leaflets describing their automatic intercommunication telephone system, the "house-phone," and a description of the work undertaken by their electric light department. They have introduced sundry improvements in their telephone system, and it should prove useful in municipal buildings, factories, etc. To get into communication with any desired room it is only necessary to depress the key opposite the required number. The "house-phone" is a cheap form of combined telephone and microphone which can be fitted with little trouble to any existing system of electric bells.

Correspondence.

THE DRAINAGE OF A HOUSE.

SIR,—In your issue of September 10, Mr. W. R. Purchase criticises, from the abstract which you were kind enough to publish, the paper on the above subject that I read at the recent Glasgow Congress of the Sanitary Institute. Before commencing his criticism Mr. Purchase is kind enough to let us know of the qualifications which he has for acting as a critic. For the past twelve years, Mr. Purchase has been acting as a building inspector to a borough council, and previous to that was connected with a pottery, where they made drain pipes, so that, although he has tested on an average three or four hundred *new* drains each year, a goodly part of the twelve years he mentions will have been taken up in learning his business as a building inspector, and, to judge from what he has written, he has still something to learn about the drainage of a house. I have had thirty-one years' experience, as an apprentice, journeyman mason, foreman, builder's manager, and clerk of works; therefore should also be expected to have some practical experience of the subject, and the parties who asked me to contribute the paper had thought that I did know something about it.

If Mr. Purchase had been present at the congress he would have heard that I did not advocate the use of fireclay pipes because they were made from fireclay, but that I advocated the use of pipes made from a fireclay which was found to be suited for making a strong non-porous pipe.

Mr. Purchase says that "this new advocacy of the fireclay drain pipe is undoubtedly a retrograde movement." Does anyone for a moment consider that a fireclay closet, substituted for a cast-iron one, is a retrograde movement? or the substitution of fireclay sinks, baths, lavatories, and urinals for cast-iron fittings of that description, can that be termed a retrograde movement? If not, then why should the substitution of a fireclay pipe for a cast-iron one be considered a step in a backward direction.

Mr. Purchase is kind enough to describe how the glazing of an inferior fireclay pipe is effected, but I have to ask him if, in his pottery experience, he never heard of a fireclay pipe lined with a fluxing "skin," and having a D.D.V. (double dipped vitrified) skin on the outside. Mr. Purchase admits that the defects to which fireclay pipes are liable can be remedied if proper care be taken in the laying of them, and with the material used. I am certain that anyone who has had experience of some of the sanitary regulations in cities and towns will admit that they are far from perfect, and will agree with me when I say that they should not be quoted as an authority as to what materials should or should not be used.

I do not think that I have proved too much by my tests; it is only a person who, like Mr. Purchase, reads a meaning into them which was not intended, or fails to grasp my line of argument, that would make that statement.

Mr. Purchase says that "hydraulic pressure is the only agent that should be used in testing," but from this I beg to differ. It is not an internal hydraulic pressure that we have to guard against in house drainage, but an internal pneumatic pressure caused by a sudden increase of temperature in the pipe, resulting from such a cause as a discharge of hot water into the drains. During my test on pipes, I found that a pipe which stood a hydraulic pressure of 60 lb. per sq. in., without the least sign of porosity, would not stand a pneumatic pressure of 2 lb. per. sq. in. From this we may infer that a hydraulic test is no guide as to whether a drain is airtight or not, and that the pneumatic test is the only one that can be relied on.

If Mr. Purchase had read the abstract with ordinary care he would have seen that I did not experiment on a glass *lined* pipe, but on what is sold, and as I thought was known to all sanitarians, as a glass enamelled pipe. I am quite aware that the majority of acids can be stored in a glass carboy, but I am not aware of any pipe founder having overcome the difference of expansion, when subjected to heat, of glass and cast iron, whereby a cast-iron pipe could be lined with glass in a satisfactory manner.

Mr. Purchase says that cast-iron pipes jointed with lead can be made perfectly tight. Has Mr. Purchase ever tested old drains, laid in this manner, which had been subjected to an intermittent flow of hot and cold water, and found them tight?

Mr. Purchase advocates the use of cast-iron pipes lined with porcelain enamel. In Mr. Purchase's pottery experience, I have no doubt he found that before a satisfactory enamelling mixture could be fused on, a temperature, ranging from 3,000 deg. to 4,000 deg. Fahr. was required in the kiln. Need I ask if this temperature can be applied to a cast-iron pipe?

I will not follow Mr. Purchase into the part of his article which does not deal with what was in my paper.

Glasgow. SAMUEL SMITH.

GENERAL BUILDING NEWS.

NEW ROMAN CATHOLIC CHURCH, HULL.—The new Catholic Church of St. Patrick, in Spring-street, Hull, was opened recently. The new building is in the Romanesque style of architecture, and is built of red bricks with stone dressings. The nave and sanctuary combined measure 100 ft. long by 24 ft. wide, north and south aisles of the same length, by 12 ft. wide. The nave arcading and the arches to the sanctuary and side chapels are of stone, with carved capitals and moulded arches. The sanctuary floor is laid with Rust's vitreous mosaic, the steps are of Idle stone with tiled risers. Sacristies, heating chamber, etc., are provided. The Communion rails are in Faience work, with three wrought-iron gates with polished brass rails. The church will be heated on the low-pressure system, and lighted throughout by electricity. Accommodation is provided for 550. The contractors were Messrs. G. Jackson and Sons, of Hull, the architects being Messrs. Brodrick, Lowther, and Walker, of Hull and Bridlington.

RENOVATION OF ST. PETER'S EPISCOPAL CHURCH, PETERHEAD, N.B.—This church was recently reopened after having been extended and renovated. Besides the introduction of a new pipe organ, the improvements include the erection of a new porch, the formation of a new entrance at the west-end of the church, and an adequate choir vestry, and the repainting and cleaning of the whole of the edifice. The joiner work has been executed by Mr. James Taylor, jun., and the building work by Messrs. Wm. Stuart and Son. The organ, which is in a case of pitch-pine, stained dark oak, with front pipes gilded in old gold, has been built by Messrs. Wadsworth Brothers, Manchester, and cost 520*l*. The alterations were carried out from the plans of Mr. Marshall Mackenzie, architect, of Aberdeen.

ALTERATIONS TO THE PRESBYTERIAN CHURCH, WOOLER, NORTHUMBERLAND.—After having undergone alterations, both externally and internally, the Cheviot-street Presbyterian Church, Wooler, was reopened on the 4th inst. The alterations consist of a new tower at the north-west corner in the Gothic style, with a spire in the centre, rising to a height of 70 ft. from the ground. Traceried windows have been put in, with stained glass throughout. The walls have been raised 5 ft., and battlemented. The interior of the walls have been repainted, the woodwork varnished, and the seats newly upholstered. The incandescent light has been introduced, and lightning conductors have been connected with the two highest points. The contractors for the work were:—Builders, Messrs. H. Elliot and Son, Berwick; joiner, Mr. T. Lumsden; slating and plastering, Mr. J. Simpson; plumbing, Mr. J. Briggs; painting and glazing, Mr. G. Robson, all of Wooler; upholstering, Messrs. C. Yokel and Co., Edinburgh. The work has been executed from plans prepared by Mr. G. Reavell, architect, Alnwick.

NEW WESLEYAN CHURCH, POLPERRO.—The new Wesleyan church at Polperro was opened recently. The new building has a total length inside of 55 ft., and is 35 ft. 6 in. in width. Accommodation is provided for 350 adults or a mixed congregation of 450 persons. The organ and choir are placed on a raised floor behind the rostrum, and there are vestries for the minister and choir. The exterior doors are made to open outwards on springs. The general design is late English Gothic. The walls are of stone, faced with stucco, and the roof is covered with Cornish slates. The timber is red deal, and the joinery, pitch-pine. The timbers of the roof have curbed ribs and panelled work stained dark. The windows are glazed with cathedral leaded lights, and the heating is by hot water, the ventilation being on the natural system with fresh air inlets at the sides and extractor in the roof. The cost of the work, exclusive of land, is about 1,850*l*. The architects are Messrs. John Wills and Sons, of Derby and London, and the building work has been carried out by the following:—Messrs. Littleton and Blatchford, masons; Messrs. T. and T. Libby, carpenters and joiners.

CONGREGATIONAL CHURCH, TOOTING.—Work is shortly to be commenced on a new Congregational church, which is to be erected in Mitcham-road, Tooting. The building will be of hard red brick, with stock sides, and stone or terra-cotta dressings. It will be heated by steam, and lighted by electricity. Seating is to be provided for 800 people, about 300 of whom will be placed in galleries. A church parlour and vestries will also be provided. The architects are Messrs. Gordon and Gunton, the contractors being Messrs. Castle and Son, Clapton. The cost will be 5,500*l*.

ENGLISH CONGREGATIONAL CHAPEL, CAERPHILLY, WALES.—The new English Congregational Chapel, situated in Van-road, Caerphilly, was opened a short time ago. Owing to the difficulty of the site, the chapel is built with two floors. On the lower floor, with the main entrance in Goodrich-street, are arranged a church parlour, two vestries, and four large classrooms, together with kitchen and lavatory, etc. The chapel itself will accommodate 500 people without galleries. Provision is made for galleries to be erected at a future date. The structure is built in Late Gothic style. The walls are faced on the outside with blue Pennant stone, with Bath stone dressings. The interior is treated with pitch-pine arches carried on columns. The total cost of the building is about 3,000*l*. It has been built by Mr. J. Howells, from the designs prepared by Mr. W. Beddoe Rees, architect, Cardiff.

MOSQUE FOR LONDON.—According to the *Daily Mail*, Mr. Robert Williams, architect, has been commissioned by a Turkish Pasha to prepare plans for the erection of a mosque to accommodate the 2,000 Mahommedans estimated to reside in London. A feature of the edifice will be a minaret, whence the muezzin will call the faithful to worship. The plans have been sent to Constantinople for the approval of the Sultan.

NEW SCHOOL, PARKHEAD, GLASGOW.—The new school erected for the Glasgow School Board at Parkhead was recently opened. The building is built of red sandstone, covered with Westmoreland slates. It is lit throughout with electric light. Accommodation is provided for 1,476 scholars. Messrs Macwhannell and Rogerson, architects, Glasgow, prepared the plans for the work.

NEW SCHOOL BUILDINGS, HUNTLY, N.B.—The new wing which has been added to the Gordon Schools at Huntly was opened recently. The main walls of the building are of local granite, with dressings of Elgin freestone. The structure is two stories in height. The ground floor has in the centre a hall, containing a staircase with double flights, giving access to the first floor, and having at either end separate cloak-room and lavatory accommodation for boys and girls. On the east side of the entrance hall is a range of three classrooms, each seated for sixty pupils, with dual desks. The western side of the ground floor is given to the gymnasium, which is a hall measuring 76 ft. long by 25 ft. wide and 14 ft. high, fitted up with the necessary appliances. The first floor has a hall in the middle, with board-room and headmaster's and teachers' rooms at the ends, and a range of three classrooms. The nine classrooms provide accommodation for 540 pupils, and the gymnasium for nearly 180 more. The building is heated by hot water on the low-pressure system from a furnace in the basement. Playgrounds enclosed by iron railings are provided both for boys and girls. The architect is Mr. R. G. Wilson, Aberdeen, and the following were the contractors:—Mason, Robert Mitchell, Huntly; carpenter, James M'Kay, Huntly, plasterer, George M'Kay, Huntly; plumber, John Wilson, Huntly; painter, A. Robertson, Huntly; slater, Adam ad Co., Aberdeen; heating, Mackenzie and Moncur, Edinburgh.

NEW SCHOOLS, DARNALL, YORKSHIRE.—New schools have been erected in Hammerton-street, Darnall. The schools consist of two blocks of buildings, one of which is to be used as an infants' school, whilst the other will accommodate the older boys and girls. The exterior walls of both schools are of Dunford coursed rockies. Two towers are utilised for ventilating the mixed school, and the infants' building is provided with a ventilating turret. The mixed school, which fronts Ouseburn-road, affords accommodation for 600 children. There is an assembly hall, 66 ft. by 33 ft., around which are grouped nine classrooms, each 24 ft. by 25 ft., and 18 ft. high, and each separated from the hall by sliding panels. Over sixty children can be accommodated in each classroom. The central hall has a panel dado, and the classrooms are decorated with coloured cement dados, whilst the cloak-rooms and entrances are lined with glazed bricks. The infants' school, fronting Hammerton-street, is similarly arranged. It has an assembly-hall, 46 ft. by 16 ft., with six classrooms grouped round it. There are two entrances, with cloak-rooms, as in the mixed school. Messrs. Forsdyke, of Sheffield, were the contractors, and Mr. W. G. Hale was the architect for the work.

PERMANENT WAY STORES, DARLINGTON.—On a site, closely approaching to their main line to the north, the North Eastern Railway Company are now completing, at Croft Junction, about three-quarters of a mile to the south of Darlington, a new central permanent way stores for the accommodation of all the material required by the engineering branch of the central division of the North Eastern Railway system. Six loading banks, four of which are about 720 ft. in length and the remaining two about 580 ft., have been constructed. Offices have been established for the storekeeper, and a range of buildings has been erected for use, during the meal hours, of the staffs employed on the "banks." The undertaking has been carried out by the North Eastern Company's engineering department from the designs and under the personal supervision of Mr. J. C. Valentine, the District Engineer at Darlington.

BUSINESS PREMISES, CHEAPSIDE.—New premises have been erected at the corner of Paternoster-row, in Cheapside. The buildings have been carried out in Portland stone, in the Renaissance style, the main façade being broken by three oriel windows, the angle feature at the corner of the buiding being an oriel supported by a life-sized Caryatide. The whole block is surmounted by a dome resting on an octagonal base. The two lower stories, which are architecturally supported by bronze pilasters, have been so designed as to be available either as large retail shops or as banking or insurance premises. The general contractors were Messrs. L. Whitehead and Co., while the architectural carved work was executed by Mr. Gilbert Scale. The architect was Mr. Delissa Joseph.

TOWN HALL AND LIBRARY, BO'NESS, N.B.—The new Bo'ness Town Hall and Carnegie Library was opened on the 14th inst. The building occupies a site on the Glebe Park. The ground plan is of cruciform shape with double transepts, the western ones being square and the eastern ones semi-circular, while the east end of the cruciform is square and the west end in semi-circular. The structure is divided into two sections immediately to the west of the eastern transepts by dual entrances and staircases, and by a common vestibule, which gives access to both sections of the building. The eastern section is devoted to the public library, and the western section to the town hall. The town hall, which is equal in height to the two floors of the library, consists of area and gallery for the audience, and large platform for speakers or performers, and retiring-rooms for principals, chorus, and orchestra. The area is seated for 709 adults, and the gallery is seated for 390 adults on fixed benches, together seating accommodation for 1,099 persons, exclusive of the platform. The estimated cost of the buildings is 12,000*l*. The architect was Mr. G. Washington Browne, of Edinburgh.

NEW BUILDINGS IN SUNDERLAND.—At the meeting of the Sunderland Building Committee held on the 5th inst., fifty-four plans were under consideration. Amongst those approved were plans prepared by Messrs. Henderson and Hall for the River Wear Commissioners' offices, which are to be erected on a site at the corner of John-street and St. Thomas's-street.

VARIETY THEATRE, GATESHEAD.—Work is shortly to be commenced on the new Alhambra Theatre at Gateshead. The work is to be carried out by Mr. James Johnson, contractor, Boldon, from the plans of Mr. Stuart S. Mould, architect.

FREE LIBRARY, PENARTH.—The foundation-stone of the new free library at Penarth was laid on the 10th inst. The building will be of the Elizabethan style, faced with Pennant stone, with Bath stone dressings. In the basement will be a boys' reading-room, 40 ft. by 18 ft., with lavatory accommodation, a stove, and heating apparatus. On the ground floor will be a hall and lending library, about 40 ft. square, with librarian's room, also a reading-room, 44 ft. long, and an average width of 23 ft. On the first floor will be a ladies' reading-room, 36 ft. in length, and an average width of 17 ft., and a reference library, 30 ft. by 18 ft. The Penarth District

Council have also under consideration a proposal to erect a caretaker's house at the far end of the library. The contractor is Mr. Fred. Bond, Cardiff, and the architect Mr. H. Snell, Penarth.

PUBLIC HALL, DARNALL, YORKSHIRE.—A site has been secured in Barnadiston-street, Darnall, for the erection of a public hall. The proposed building will be over 100 ft. long by 42 ft. frontage, and will hold 600 to 700 people. It will be provided with meeting-hall, committee-room, ladies' and gentlemen's cloak-rooms fitted with lavatories, and kitchen. The structure will be heated and lighted throughout. There will be a stage at one end of the hall, and a musicians' gallery at the other. Mr. A. C. Turnbull, architect, has prepared the plans for the work.

BANK PREMISES, SOUTH SHIELDS.—A new branch office of the York City and County Bank has been erected in Fowler-street, South Shields. The building is in the late Renaissance style. It has a granite base up to the window-sill level; the remainder of the ground floor is built in coursed ashlar, and the walls above are faced with thin Commondale bricks, with stone dressings. The principal entrance, situated at the corner of Denmark and Fowler streets, is under a heavy arched stone canopy, which carries a circular angle bay finished with a low turret roof. On the ground floor is the banking-room, panelled in mahogany to a height of 9 ft., the ceiling being of panelled plaster. Adjoining are the manager's room, safe-room, strong-room, and latrines. The first floor consists of a suite of offices with the entrance from Denmark-street, while the caretaker's rooms are situated on the second floor. The premises have been erected by Messrs. W. J. Robertson and Sons, South Shields, from plans prepared by Messrs. Clark and Moscrop, of Darlington.

NEW THEATRE, GLASGOW.—The new "King's Theatre," situated at the corner of Bath-street and Elmbank-street, Glasgow, was opened on the 12th inst. The outer walls of the building are of Lochbarbriggs stone from Dumfriesshire, while the interior is decorated in marble, tile work, and fibrous plaster. Seating accommodation is provided for about 2,000 persons. The lower floor contains the pit and orchestra stalls, accommodating about 700 of the audience, and on the same floor are a scene dock, artistes' dressing-room, etc., manager's offices, refreshment saloon for the pit, and pay-boxes at each of the various entrances. The second floor includes the dress circle, seated for about 300, with two private boxes on each side, the foyer, crush-room, grand staircase, and saloon for the dress circle and stalls, with additional dressing-rooms for artistes. On the third floor the upper circle has seating accommodation for over 300 persons, and there are two private boxes, one on each side of the proscenium opening, also a saloon, artistes' dressing-rooms, etc. The fourth floor consists of the gallery, to accommodate 700, a saloon, and various small rooms. On each floor are cloak-rooms and lavatories. There are separate staircases to every floor. The principal entrances are from Bath-street, while from Elmbank-street are two entrances to the pit and two to the gallery. The contractors were Messrs. Morrison and Mason, and the architect was Mr. Frank Matcham. The cost has been about 50,000*l*.

NEW COUNCIL OFFICES, HINDLEY, LANCASHIRE.—The new public offices which have been erected by the Hindly Urban District Council were opened recently. The premises are three stories in height. The ground floor contains offices for clerk, assistant clerk, collector, assistant collector, medical officer, overseer's and school attendance officer's rooms, and waiting-rooms. The first floor contains council chamber, committee-room, chairman's parlour, surveyor's drawing office, private office, and plan-room, and a spare room. The attic contains rooms for the caretaker, and the basement contains nuisance inspector's office, pay office, and men's waiting-room, heating apparatus, and rooms for future offices or store-rooms. There is a front or side entrance from Wigan-road, and also an entrance from Cross-street. The elevations are built of red pressed bricks, with Yorkshire stone dressings. The contractor for the building was Mr. D. A. Ablett, of Wigan, and the work has been carried out under the supervision of the architects, Messrs. Heaton, Ralph, and Heaton, of Wigan. The total cost of the building, including furnishing, etc., was 7,318*l*.

TENEMENT BUILDINGS, DUNDEE.—Tenement properties are being erected in Blackness-avenue, Dundee. The buildings, which are being put up by a syndicate, will consist of four four-roomed houses, twenty-four three-roomed houses, and four two-roomed houses. All the houses will have oriel windows, and will be lit by electricity. The following contractors have been selected:—Mason work, Messrs. James Binny and Co.; joiner work, Messrs. W. and R. Brownlee; plumber work, Mr. David Brown. The other contracts have not yet been settled. For the same syndicate six blocks of superior tenement property have been erected at Baxter Park-terrace. The tenements are erected on the west side of the park, and consist of forty-eight houses of three and two rooms. Four of the tenements are composed of three rooms and two rooms, the three rooms having baths and hot and cold water, and the two rooms hot and cold water, sculleries, and lavatories. Two of the tenements consist of two-romed houses, with baths, lavatories, hot and cold water, etc. The baths in the houses are vitrious enamelled American baths, and are open. The contractors were:—Mason work, Messrs. James Binny and Co.; joiner, Messrs. W. and R. Brownlee; plumber, Mr. David Brown; painters, Messrs. James Mackay and Son; plasterers, Messrs. Reoch and Kilgour; grates, gasaliers, etc., Messrs. G. H. Nicoll and Co. Mr. James Sibbald, architect, designed both properties.

DISTILLERY EXTENSIONS, BADENOCH, N.B.—Contracts are about to be accepted for additions to and improvements on the main building of the Dalwhinnie Distillery, as well as for the erection of more workmen's dwellings, and for the introduction of an additional supply of water by gravitation. It is estimated that the contemplated outlay will amount to some 2,000*l*. or 3,000*l*. Mr. A. Mackenzie, C.E., Kingussie, is the architect for the new works.

NEW LIBRARY, GLASGOW.—The Kingston District library was opened on the 8th inst. The building occupies a site in Paisley-road, and includes, besides the library, a series of public halls and the district police office. The front elevation is of red stone. A corridor leads to the library, which is in the rear of the main building, and is two stories in height. On the ground floor are the lending department, the general reading-room, and a reading-room for ladies, while upstairs are reading-rooms for boys and girls. The designs for the work were prepared in the City Architect's department, under the supervision of Mr. M'Donald, by Mr. Horn.

NEW ISOLATION HOSPITAL, LANCASTER.—A new isolation hospital for men, and a fever block are to be erected at Lancaster County Asylum. The plans for the work have been prepared by Messrs. Willink and Thicknesse, architects, Liverpool, and the tender of Messrs. J. Hutch and Sons, Lancaster, which amounts to about 20,000*l*., has been accepted.

SANITARY AND ENGINEERING NEWS

MONTROSE WATER SUPPLY.—The Montrose Town Council have recently had under consideration a report from Messrs. Henderson, of Glasgow, in regard to the water supply. During June there was a scarcity of water at Kinnaber, and it was considered whether the supply could be supplemented by an artesian well. Messrs. Henderson stated that if the bore was put down where they indicated the chances were in favour of tapping a large supply of water. Not only would the bore act as a test power for proving the quality of water, but would at the same time be sufficiently large to be of practical purpose. The subject was adjourned for further consideration.

FOREIGN.

FRANCE.—The Paris Municipality has caused to be erected at Père Lachaise a monument to the memory of workers who died in the service of the City of Paris. This monument, which was designed by the late M. Dupré, the architect, consists of an obelisk, by which stands a veiled figure of a woman depositing a crown; the figure is by M. Denys Puech.——M. Bernstamm, the sculptor, has completed the model for a monument to Pailleron, the author of so many well-known plays. It will be erected in the Parc Monceau, and consists of a stele supporting the bust of Pailleron, before whom a female figure lays a garland of flowers; this figure is supposed to be a portrait of Jeanne Samary, who, at the Theâtre Français, was one of the principal interpreters of the works of Pailleron.——A monument to the memory of Daubigny, the landscape painter, has been erected by public subscription at Anvers-sur-Oise.——There has been some new destruction among the ancient monuments of Avignon. This time, however, the offenders are not the municipal authorities, but the military engineers, who have destroyed the ancient cloister of the convent of the Celestins, which had in recent times been used as a military prison.——The Société Archéologique of the South of France has succeeded in saving from destruction the XIIIth century gateway enclosed in the fortifications of the picturesque town of Cordes, founded by the Counts of Toulouse.——A steel bridge is to be built over the Rance between Port Jean and Port St. Hubert, near Dinan. ——A Presidential decree has been issued authorising the establishment of a local school of architecture at Rouen.——The death is announced, at the age of seventy-eight, of a distinguished collector, M. Emile Peyre, whose splendid collection of mediæval and Renaissance furniture and woodcarving is valued at ten million francs. It is said that this remarkable collection has been left as a legacy to the Musée des Arts Decoratifs.

ALGERIAN ONYX MARBLES.—Mr. Scratchley, British Vice-Consul at Philippeville, reports that the onyx quarries at Aïn Smava are the only ones worked. This industry, he adds, suffers principally from the cost of labour and the difficulty of finding skilled marble workers. The competition with marbles imported from Europe renders it difficult to develop the quarries as one could wish. The onyx marbles from Aïn Smava, which are in the hands of a house at Marseilles, are sent to France to be dressed, and come back to the place of origin if required. It is easy to understand that, under these conditions, builders prefer buying marbles ready dressed from Europe; yet, as regards quality and beauty, nothing can be finer than some of the onyx. The quarries cover 7,500 acres, and the beds are very thick, varying in width from 6 ft. to 55 ft. The following are the principal qualities found:—Golden, with a seam, 33 ft. wide; cloudy, 13 ft.; African breccia, 13 ft.; red African, 10 ft.; red agath, 10 ft.; denticulated, 1 ft. 8 in.; Jasper agath, 7 ft.; ondulated red, 5 ft.; rose agath, 3 ft. The first two seams can produce columns from 12 ft. to 15 ft. in length, which is very rare in onyx marbles. Eight of these monolithic columns have been prepared at Marseilles for the Roman Catholic Cathedral at Westminster, where they are now, no doubt, in position, and others are in preparation. If they are anything like the onyx employed at the Town Hall of Constantine, they are, says Mr. Scratchley, worth the trouble of going to see. An order from America for columns of 33 ft. to 39 ft. in length was received, but the great difficulty is to get blocks of this size down to the sea. The very heavy railway rates are also against profitable operations.

GRANITE INDUSTRY IN BRITISH INDIA.—According to a statement in the *Indian Review* a new industry has recently been developed among the granite quarries of Palovaram, in the Madras Presidency, viz., the manufacture of granite pillars, colonnades, etc., and stone-sets for paving streets and for houses. This enterprise, although yet in its infancy, is already employing over a thousand native artisans, all the cutting and polishing being done by hand, without the aid of any machinery.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. W. B. Wilkinson and Co., fire-proof floor specialists, concrete paviors, and artificial stone manufacturers, of London and Newcastle, are removing their London business from 1, Victoria-street to new offices and works which they have erected at the junction of Townmead-road and Imperial-road, Fulham, close to the river and to the Chelsea goods station.

EAST LONDON CHARITIES.—The administration of the local Henderson Charity, founded for the benefit of the parishioners of St. George-in-the-East, will shortly be remodelled in terms of a scheme framed by the Charity Commissioners to alter their scheme made eleven years ago so as to empower the trustees to grant pensions of from 10s. to 12s. a week, jointly, to married couples, with a pension of from 7s. to 10s. a week to the survivor in each instance. The Borough Council are about to add the site of the old engine-house, which has latterly been assigned as a residence to aged parishioners, to the burial ground in Hackney-road, in which it stands, and will erect, in its stead, a new home in Nightingale-road. Wood Green, where the Shoreditch Charity Trustees have recently built some new almshouses. The latter buildings supplant those in Old-street, St. Luke's, which were founded in the latter half of the XVIIth. century, and of which the site was purchased from the trustees for the new police-station.

NORWEGIAN TIMBER TRADE.—It is reported officially that the export of timber from Norway in 1903 was nearly 9 per cent. more than in 1902, and, as prices were generally good, the timber industry brought to the country between 600,000*l*. and 700,000*l*. more than the year before. The following table gives the total export of timber for the last three years:—Planed timber, 1903, 665,079 cubic metres; 1902, 598,568 cubic metres; 1901, 565,741 cubic metres. Sawn timber, 1903, 585,561 cubic metres; 1902, 536,174 cubic metres; 1901, 468,847 cubic metres. Hewn timber, 1903, 118,416 cubic metres; 1902, 105,686 cubic metres; 1901, 67,937 cubic metres. Round timber, 1903, 572,003 cubic metres; 1902,

542,375 cubic metres; 1901, 510,940 cubic metres. Staves, 1903, 88,394 cubic metres; 1902, 85,506 cubic metres; 1901, 91,760 cubic metres. Laths, 1903, 102,867 cubic metres; 1902, 93,416 cubic metres; 1901, 99,999 cubic metres. From Christiania alone the quantity exported was 232,502 cubic metres, compared with 202,472 cubic metres in 1902, and 200,792 cubic metres in 1901. The principal exporting centres of timber unworked or half-worked are Frederikstad, Christiania, Drammen, Fredrikshald, Porsgrund, Christiansand, Larvik, Trondjhem, and Arendal; and of worked timber, Drammen, Christiania, Skien, Sarpsborg, Porsgrund, Arendal, and Fredrikshald. The bulk of the timber worked and unworked —in 1902 to the value of 2,096,083*l.*—goes to the United Kingdom; and France, Belgium, Germany, the Netherlands, and Denmark are the next largest consumers. The Vice-Consul at Fredrikstad, one of the chief centres of this industry, reports that business has been good and, on the whole, profitable, whilst a good trade was maintained with the Cape. From the west coast of Norway there was a good market in 1903 for almost all sizes, but, notwithstanding the good selling prices, the trade in sawn timber is reported as not giving a fair return, owing to the very high prices for logs of late years. It is probable that, owing to the mills having had to pay higher prices for their log supply for the current year, prices will still continue to be high.

CHURCH OF ST. ANDREW, HOXTON.—Dr. Tristram, K.C., Chancellor of the Diocese of London, has granted a faculty for the carrying out of some improvements and repairs of the fabric of the church. The new works will comprise, at an estimated cost of 1,000*l.*, the removal of the west gallery and stairs, a porch with gable at the west door, a choir vestry with organ gallery, and a rearrangement of the organ chamber, choir seats, and desks so as to provide for a total of 570 sittings. The church was built in Canal-road, Hoxton, in 1864-5, after plans and designs by Mr. C. A. Long, in the Early English style, the organ being by Holdich.

PICTURE POST-CARDS OF BATH.—Messrs. B. and J. F. Meehan, of Bath, send us a set of six picture post-cards of "Old Bath," reproduced from drawings by David Cox. These give some of the notable buildings of Bath, accompanied by figures in the costume of the period when Bath was a centre of fashion. They are interesting and well produced.

VICTORIA HISTORY OF THE COUNTIES OF ENGLAND.—The resignation is announced of Mr. H. A. Doubleday as joint editor with Mr. William Page, member of the Council of the Society of Antiquaries, of the Victoria County History. Mr. Page had been appointed general editor of the series of volumes which are issued from time to time, and form a most valuable complement to the existing standard county histories.

RED LION INN, HIGHGATE.—The Old Red Lion Inn at Highgate has just been pulled down. It had been a famous hostelry in its day, being frequented by travellers on the Great North-road, and by graziers and cattle-drovers on the last stage of their journey with cattle to the market in West Smithfield. It was also one of the many inns—at one time twenty in number—where was observed the latterly ribald custom of "Swearing on the Horns," for which were used a pair of either ram's or stag's horns mounted upon a staff In Hone's *Every Day Book*, vol. ii., 1841, will be found an illustration after a woodcut by George Cruikshank of the ceremony at the Fox and Crown, on Highgate-hill, with a description of its observance, which says that the usage first obtained, it seems, at the old Gatehouse, whither, in the XVIIIth century, persons of quality would ride from town to be sworn in and so made free of Highgate. The Gatehouse, which stood across the road at the entrance into the forest, where tolls were received for the Bishops of London, was pulled down in 1769, and replaced with a turnpike gate. Dwelling houses are to be built upon the site of the inn.

HAGGERSTON PUBLIC BATHS.—Messrs. W. E. Rendle and Co. ask us to mention that skylights in the building (illustrated in our last issue) are glazed on their patent "Invincible" system.

"THE LARGEST GRAVING DOCK IN ASIA."—Describing the new Colombo Harbour Extension Works, Mr. A. R. Slater, the Assistant Colonial Secretary of Ceylon, states that they are making good progress. The amount spent during the year 1903 was nearly Rs. 3,000,000, bringing the total expenditure on the present works up to Rs. 13,426,575, the grand total expenditure since the commencement of the south-west breakwater in 1873 having been Rs. 31,042,771. The new breakwaters are now far advanced towards completion, and it became necessary in 1903 to decide the question of the width of the entrance to the harbour between the old or south-west breakwater and the island or north-west breakwater. After full consideration the width was fixed at 800 ft., with the concurrence of the consulting engineers, the admiral, and the Harbour Board. No narrower entrance appears to be convenient for navigation, but it is considered that a width of 800 ft. will be sufficient for the largest steamers to enter the harbour. It is anticipated that the new graving dock will be open in 1906. The original estimate of cost was Rs. 5,218,380, and the Admiralty and the colony agreed to provide this amount in equal shares. Subsequently, however, it was decided to increase the length of the dock from 500 ft. to 700 ft., and as the Admiralty were unable to increase their contribution the whole additional cost—28,700*l.*—is being borne by the colony. The dock, when completed, will be the finest and largest in Asia, and, indeed, will probably challenge comparison with any of the dry docks available for the use of His Majesty's Navy. The Merewether dry dock at Bombay, the No. 1 dry dock at Hong Kong, and the dry dock No. 3, now under construction at Singapore, are 500 ft. long on the floor, or 200 ft. shorter than the Colombo graving dock, while, although the docks under construction at Gibraltar and Malta are to have lengths of 850 ft. and 750 ft. respectively, it must be remembered that they are really double docks. The depth over all the Ceylon dock at high water will be 32 ft., which also compares favourably with the depths of the docks at Bombay, Singapore, and Hong Kong. The breadth of the graving dock will be 85 ft. at the entrance. The longest ships in the Navy—the *Good Hope* class—are 500 ft. long; the broadest—the *King Edward* class—78 ft., while none draw more than 27½ ft. The Colombo dock will therefore easily accommodate the longest and largest British war vessels for many years to come. As regards merchant ships it will take anything afloat, with the exception of the new boats on the Atlantic line, but none of these is ever likely to be seen at Colombo.

NATIONAL ASSOCIATION OF HOUSE PAINTERS.—The eleventh Annual Convention of the National Association of Master House Painters and Decorators of England and Wales will be held in Manchester next week, the proceedings commencing on Monday. An exhibition of manufacturers and of apprentices' competition and international studentship competition drawings will be opened in St. James's Hall, Oxford-street. On the evening of the 19th the President of the Association (Councillor James Higson, of Salford) will hold a reception in the hall. Mr. J. D. Crace, President of the Institute of British Decorators; and Mr. R. Glazier, Head Master of the Manchester Municipal School of Art, will deliver addresses on special subjects, and various papers will be read by others. The annual dinner is fixed for the Wednesday evening, at the Midland Hotel.

A FLAME-PREVENTING FLUID.—The Snowdon's Flame-Preventers Company send us a sample of their fluid for rendering substances which have been steeped in it (according to directions given on the label) non-flammable. Some articles sent to us as specimens which had been treated by the fluid, fully bear out what is claimed for it. Bits of wood which had been steeped in it entirely refused to burn; and some pieces of light textiles, which would ordinarily have burnt up in a moment when held over a flame, merely blackened. The manufacturers claim that with this chemical compound, the invention of Mr. F. Seaton Snowdon, and to which they have given the name of "Snowdon's Preventer," it is possible to render every variety of flannelette, cotton and woollen goods, silks, satins, laces, curtains, muslins, bed-hangings, ladies' and children's clothing, matting, paper, wood of every description, and, in short, every inflammable substance, absolutely flame-proof. The tests we have been able to make seem quite to bear out this claim.

LOCAL GOVERNMENT BOARD INQUIRY AT BOOTLE (LANCASHIRE.)—Mr. H. P. Boulnois, C.E., an Inspector under the Local Government Board, held an inquiry on the 8th inst. at the Bootle Town Hall with reference to the applications of the Council for the following loans:—940*l.* for public conveniences, 4,600*l.*, widening Linacre-lane Canal bridge; 3,000*l.*, construction North Docks subway. The Town Clerk explained that the 940*l.* was required for the erection of three conveniences in three places in the borough—viz., Stanley-road Canal bridge, Coffee-house bridge, and Irlam-road. The conveniences would be placed in the main thoroughfares. The estimated cost of each place would be:—Stanley-road, 600*l.*; Coffee-house Bridge, 210*l.*; Irlam-road, 130l.; total, 940*l.* The Town Clerk, proceeding to the next application, said the sum of 4,600*l.* was required for the construction of a new bridge over the Leeds and Liverpool Canal in Linacre-lane. The neighbourhood was rapidly developing, and Linacre-lane was one of the main outlets for traffic from the north end of Bootle. He thought there could be no doubt that in years to come the lane would be one of the principal arteries for traffic in that neighbourhood. The old bridge still remained, and was a great obstacle to traffic. It was only 10 ft. wide, and had a span of only 24 ft. The whole of the widening of the road had been completed with the exception of the bridge in question, and what was proposed to do now was to pull down the old bridge and erect a new one with a width of 72 ft., with improved levels, which gave easy gradients on both sides of the bridge. The sum of 3,000*l.* was required for the construction of a subway under the North Mersey goods yard of the Lancashire and Yorkshire Railway and leading to the North Docks. The execution of the work had already been sanctioned by an Act of Parliament. The subway would be 83 yds. in length, 6 ft. wide, and would be illuminated and drained. The Town Clerk admitted the difficulties that stood in the way of patrolling the subway if it was kept open all through the night. The Inspector said he thought it was a great risk for the Corporation to take in regard to the matter. The Town Clerk said he could only admit the difficulty, and it was proper that the Local Government Board should know of it. Subsequently Mr. Boulnois proceeded to inspect the several localities mentioned.

WAR MEMORIAL, RHYL.—The memorial erected by public subscription to the soldiers from Rhyl who fell during the late South African War was unveiled on the 5th inst. The memorial consists of a base of two steps of Yorkstone, a pedestal of Kenmay fine-axed Scotch granite, on which is the inscription, in leaded letters, the whole being surmounted by the figure in Carrara marble of a soldier, representing the Royal Welsh Fusiliers, with reversed arms. It was designed and executed by Mr. C. Chatham, sculptor, Rhyl.

CAPITAL AND LABOUR.

JOINERS' STRIKE, NEWCASTLE.—A dispute has arisen between the joiners employed in connexion with the erection of the new infirmary and the Building Committee, which has had the effect of causing the joiners to come out on strike. It appears that the grievance is not with the contractors, but solely with the Building Committee, who, it is stated, have given part of the joiners' work to cabinet-makers, and because of this alleged encroachment the joiners ceased work.—*Newcastle Daily Chronicle.*

Legal.

CASE UNDER THE LONDON BUILDING ACT:

WHAT IS A "BUILDING"?

IN the South-Western Police Court, before Mr. Lane, K.C., on Monday last, Mr. Lawton Ford, District Surveyor for West Wandsworth, summoned Mr. Peter Bleines, of Garratt-lane, for erecting a one-story stable at the corner of Wilna-road and Farlton-road without having previously given two clear days' notice, under section 145 of the above Act.

Mr. Hanne, solicitor, appeared for the defence.

It appeared that in January last the defendant inquired of the surveyor the height to which he could raise the fence walls, as he wished to protect the windows of his property from the roughs of the neighbourhood, and the defendant was informed that by section 201 he could raise the said walls to a height of 7 ft., but that no building could be erected against the walls, as, owing to the position, a building would be illegal. The surveyor watched the premises, and discovered that quite recently, a building had been erected 18 ft. long, 10 ft. wide, and 7 ft. high, and used as a stable. The surveyor then gave the defendant the option of taking down the building, but the latter declined, whereupon the surveyor intimated that he should first take out a summons for neglect as to notice, and then proceed as to irregularities.

It further appeared that the building was not wholly dependent for its support from the surrounding walls, some uprights and cross-timbers having been fixed to carry the corrugated iron roof, and the defence appeared to disregard the existence of the walls in relation to the building.

Mr. Hanne to the surveyor: Do you say that a notice must be given for a greenhouse?

The surveyor: Not if the greenhouse is detached from other buildings.

Mr. Hanne: We are not treated in the Act to a definition of a building.

The surveyor: No.

Mr. Hanne: What is your definition of a building?

The surveyor: The legislature found the definition a difficult one, and were apparently not equal to the task, and I am not disposed at a moment's notice in a witness-box to come to the rescue, but if this is not a building, it is difficult to conceive of one.

Mr. Hanne: Well, are not rabbit-hutches exempt, and is not this more like one?

The surveyor: Rabbit-hutches not exceeding 30 ft. super. and 5 ft. in height are exempt, but this is a rather large rabbit-hutch, 18 ft. by 10 ft. by 7 ft.

The magistrate: I cannot conceive that this is not a building under the Act, and if you like to so glorify your rabbit-hutch it may become a building.

In the result, after further discussion, the magistrate held that the surveyor was entitled to a notice, that the erection was a building, and fined the defendant 40s., and costs.

WEST-END ANCIENT LIGHT CASE SETTLED.

IN the Vacation Court on Wednesday last the case of Milton *v.* Maskelyne was again in the list for hearing before Mr. Justice Bigham, on a motion by the plaintiff for an interim injunction to restrain the defendant from obstructing the plaintiff's ancient lights by reason of building alterations to the St. George's Hall, Langham-place.

On the case being reached, counsel stated that the parties had come to a settlement of the dispute, the terms of which were not publicly stated.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

17,960 of 1903.—R. S. ALLAN: *Machines for Grooving Wood.*

Machines for grooving wood, comprising a work-carrying frame adapted to be reciprocated upon or in a suitable frame, and to have freedom of movement transversely to the reciprocating motion, an adjustable fixed guide or guides adapted to lie at any angle with the reciprocating frame, and to have its angle altered when altering the angle at which the work-carrying frame lies, said reciprocating frame and guide being so connected that as the reciprocating frame travels its freedom of lateral movement will cause it to follow the angle at which the guide is set, and so cause a groove or corresponding angle to be cut in the work carried by the reciprocating frame.

20,168 of 1903.—J. W. MACKENZIE: *Heating of Buildings.*

An arrangement for heating buildings or rooms by means of the waste heat from explosion engines, consisting in a heater, the water inlet of which is connected to the outlet from the cooling water-jacket of the cylinder, while the water outlet from the heater is connected to pipes arranged in the rooms to be heated, said heater being so arranged that the hot waste gases escaping from the cylinder of said engine pass therethrough and give off their heat to the water before the latter enters the room to be heated.

21,406 of 1903.—A. B. RECK: *Hot-Water Heating Apparatus.*

A hot-water heating apparatus having an arrangement for increasing the velocity of the water, consisting in the combination of a continuous hot-water heating circuit, a heater inserted in the circuit, a pipe connecting the main return pipe of the circuit with the main flow pipe as a by-pass short circuiting the heater, a valve on the by-pass, and a regulating valve controlling the flow of water through the heater.

22,111 of 1903.—W. NAYLOR and R. CROMPTON: *Syphon Water-Waste Preventers for Closets and the like.*

This invention consists of a forcing chamber with an internal wing operated by levers and chain from the exterior of the cistern in such a manner that the wing moves through an arc of a quarter circle, or thereabouts, and forces the water into the long leg of the syphon which then acts in the ordinary manner, and the wing falls back into the normal position and allows a free passage of the water.

22,220 of 1903.—J. A. BEATTIE: *A Ventilating Roof Ridge.*

A ventilating roof ridge, to be made of clay, terra-cotta, metals, cement, concrete, stone, slate, or timber, constructed in lengths or sections about 2 ft. in length, having apertures at the underside where it fits on roof, and at the top of the ventilator for direct ventilation, and having two tongues or flanges extending internally the whole length, protruding from either side, placed in such a position as to intercept rain, snow, and draughts. At the junction of the tongues or flanges with the sides, voids or slits extend the length of the tongues for the purpose of discharging rain water, and snow, and the like, which has been intercepted and thus prevented falling inside the building.

22,507 of 1903.—J. A. STEVEN: *Electrically-Controlled Hoists.*

This invention relates to locking devices for hoists or lifts, and its object is to make it impossible to start the hoist or lift until the gate is securely closed, in which case only it will be possible to move the car away from the landing. According to the invention the usual locker or latch, which is fixed on the movable part of the gate, operates a switch which controls the starting gear of the lift. When closing the gate, this locker or latch falls or is pressed over a ridge which is part of the box which carries the switch. Only after finally closing the gate is the switch closed by the action of the falling latch, thereby completing the electric circuit, and enabling the starting gear to be operated. When opening the gate, the weight of the lever, sometimes assisted by a spring, or an additional weight, breaks the circuit rapidly.

14,711 of 1904.—H. M. GORDON, H. C. RIGAUD, and E. GEILLW: *Ceramic Tiles and Apparatus for Moulding same, and other Grooved Ceramic Articles.*

This relates to an apparatus for moulding ceramic tiles or other grooved ceramic articles, in which the mould is formed in halves with an interchangeable bottom plate, having on its upper face the design of the article and a fixed plate on which the bottom plate rests, said bottom plate and fixed plate being locked together with the halves of the mould when the latter are closed.

15,543 of 1904.—C. D. CUTTS, W. A. SMITH, and J. E. CAMERON: *Window Screens.*

A window screen, comprising in its construction two U-shaped tubular telescopic frame sections, the free ends of one of the said frame sections slidably contained within the free ends of the other frame section, a groove formed by a space in the tubular part of each of the said frame sections, and screens slidably contained in the groove in each of the said frame sections.

15,547 of 1904.—E. J. ROBERTSON: *Reversible Window and like Sashes.*

Reversible window and like sashes suspended from the unweighted ends of the sash cords by trunnions outstanding from the edges of the stiles of the sashes and entering loops or rings at the ends of the said cords, grooves being provided in the pulley stile of the weight box for the said trunnions to slide in, the grooves for the trunnions of the outer sash running into and becoming identical with the grooves for the trunnions of the inner sash, parts of the outer and parting beads being removed, and part of the inner beads being hinged to allow the sashes to be reversed.

22,113 of 1903.—J. B. LE MAITRE: *System of and Means of Ventilating.*

This consists in the use and construction of ventilators comprising two ducts, or sets of ducts ,or passages arranged so that the velocity of air rushing through one set of ducts communicating with the open, or a fan or blower sucks air through the other set of ducts opening in the first-named ducts, and communicating with the interior.

24,208 of 1903.—J. ENRIGHT: *A Combined Level and Plumbing Instrument.*

A combined level and plumbing instrument, consisting of an oblong block or bar having a level under surface and fitted with a plate or quadrant marked with degrees and fractions of degrees, in front of which is suspended a pivoted hand or pointer for indicating the angle at which the block is placed, and which is provided with a weight or pendulum for holding the same in a vertical position.

24,948 of 1903.—K. SCHMIDT: *Sinking Shafts by the Freezing Process.*

In the sinking of shafts, particularly in ground which is very watery or contains much brine, a method of producing a body of cold or freezing layer by means of a number of pipes connected with one another, and communicating with compressors in which pipes gases containing moist cold producing vapours gradually and continuously expand, flowing at such a rate that even in the last pipe a sufficient quantity of moist vapours is present, and thus a uniform transmission of cold effected through the whole of pipes connected together.

26,600 of 1903.—P. STEPHAN: *Construction of Arches with Considerable Span for Roofs and the like.*

This consists in constructing trussed arches or arched girders with considerable span for roofs and the like, the distinguishing feature of which is that for the purpose of forming one or both chords of such arches, boards are laid flat on a suitable floor, bent edgeways and fixed, and the layers of the two chords trussed by means of braces and posts furnished with recesses and supported by intermediate stays at the points where they are fixed, whereupon one or more further layers of bent boards are put over the posts, braces, and stays, and fixed by nailing so that the posts and braces come between the layers of boards, join the two chords and make the framework so constructed rigid.

4,301 of 1904.—L. STEINMETZ: *Metal Plates for Buildings, Ships, and other Structures.*

A composite metal plate for structural purposes, comprising two or more outer plates connected together by strengthening plates bent in the form of dovetails, said outer plates being provided with undercut ribs engaging the openings of the dovetails formed by the strengthening plates.

8,722 of 1904.—K. SCHMIDT: *Sinking Mining Shafts and the like by the Freezing Process.*

A method of producing a frozen layer or wall in connexion with the sinking of shafts, etc., in boggy or briny soils, according to which damp vapours are caused to flow through a number of freezing pipes connected together in the usual manner and with compressors and to gradually and increasingly expand and generate cold, so that even in the last pipe of a group there is a sufficiency of damp vapour, and thus a uniform transmission of cold through the whole of the freezing pipes which are connected together.

14,411 of 1904.—W. H. BAXTER: *Machinery or Apparatus for Screening, Elevating, and Loading Broken or Crushed Stone, or Refuse Clinker, and other Material.*

Screening, elevating, and loading mechanism for use in connexion with a stone breaker, upon a system in which the material after leaving the jaws of the stone breaker is passed through a short screen or conveyor, and is then elevated into an upper screen, where it is graded according to size and delivered into storage compartments, while the rejected material is passed to and raised by a "raff elevator" above the upper screen shaft and there fitted to the mouth of a conduit, by means of which this rejected material gravitates back to the jaws of the stone breaker.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

September 1.—By MADDISON, MILES, & MADDISON (at Yarmouth).

Yarmouth, Norfolk. — 64 and 65, Victoria-rd., f., w.r. 16*l.* 9s. 4d.	£200
11 and 12 Row, 105, King-st., f.	125
14, 15, and 16 Row, 116, King-st., f., w.r. 28*l.* 12s.	230
13 and 14 Row, 60, Market-pl., f., w.r. 19*l.* 10s.	145

September 5.—By J. R. EVE & SON.

Harpenden, Herts.—Carlton-rd., the "Red House" and 6 a. 1 r. 18 p., f. and c., p.	5,600

By W. BROWN & Co. (on the Estate).

Amersham, Bucks.—Upper-rd., four freehold building sites, 9 a. 1 r. 32 p.	1,055
Finch-la., six freehold cottages and 0 a. 3 r. 27 p.	800
Finch-la., three freehold building sites, 3 a. 0 r. 15 p.	100
London-rd., a freehold building estate, 46 a. 2 r. 27 p.	1,500

September 6.—By EASTMAN BROS.

Forest Hill.—27, Westbourne-rd., u.t. 56 yrs., g.r. 7*l.* 10s., e.r. 42*l.*	275

By H. & R. L. COBB (at Ashford).

Lydd, Kent.—"Old House Field," etc., 21 a. 2 r. 34 p., f.	500
"Holstock Field," 4 a. 0 r. 16 p., f.	100
"Twelve Acres Field," 12 a. 1 r. 0 p., f.	500
"Ducking Stool Field," 2 a. 0 r. 34 p., f.	175
Old Romney, Kent.—"Coney Banks Enclosure," 13 a. 2 r. 10 p., f.	475
Kennardington, Kent. — "Dennes Wood," 26 a. 1 r. 12 p., f.	400

September 7.—By DOUGLAS YOUNG & Co.

West Ham.—40 and 42, St. Stephen's-rd. (s.), u.t. 77 yrs., g.r. 10*l.*, y.r. 77*l.* 10s.	850
Frinton-on-Sea, Essex.—Esplanade, "High Cliff," f., y.r. 45*l.*	640

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; g.r. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

MEETINGS.

SATURDAY, SEPTEMBER 17.

Architectural Association.—Week-end visit to Kettering and district.

Northern Architectural Association.—Visit to Consett Iron Co.'s Premises. 3 p.m.

Institute of Sanitary Engineers.—Visit to Reading Waterworks. Reading Station 2.30.

MONDAY, SEPTEMBER 19.

National Association of House Painters and Decorators.—Opening meeting of annual convention, St. James's Hall, Manchester.

WEDNESDAY, SEPTEMBER 21.

Institute of Sanitary Engineers.—Meeting of Election Committee, 3 p.m.; General Purposes and Finance Committee, 5 p.m. Opening Sessional Meeting. Paper on the "Disposal of Sewage for Mansions and Country Houses," by Mr. A. S. Goodridge.

Provident Institution of Builders' Foremen and Clerks of Works.—Ordinary Meeting. 8 p.m.

SATURDAY, SEPTEMBER 24.

Incorporated Association of Municipal and County Engineers.—District Meeting at Withington, near Manchester.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, manuscripts, or other documents, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.			
Hard Stocks.	1	15	0	per 1000	alongside,	in river.
Rough Stocks and Grizzles	1	13	0	,,	,,	,,
Facing Stocks ...	2	12	0	,,	,,	,,
Shippers	2	10	0	,,	,,	,,
Flettons	1	10	0	,,	at railway depôt.	
Red Wire Cuts ...	1	14	0	,,	,,	,,
Best Fareham Red	3	12	0	,,	,,	,,
Best Red Pressed Ruabon Facing	5	0	0	,,	,,	,,
Best Blue Pressed Staffordshire ...	4	4	0	,,	,,	,,
Do. Bullnose	4	10	0	,,	,,	,,
Best Stourbridge Fire Bricks.....	4	8	0	,,	,,	,,
GLAZED BRICKS.						
Best White and Ivory Glazed Stretchers	13	0	0	,,	,,	,,
Headers	12	0	0	,,	,,	,,
Quoins, Bullnose, and Flats.....	17	0	0	,,	,,	,,
Double Stretchers	19	0	0	,,	,,	,,
Double Headers...	16	0	0	,,	,,	,,
One Side and two Ends	19	0	0	,,	,,	,,
Two Sides and one End	20	0	0	,,	,,	,,
Splays, Chamferred, Squints	20	0	0	,,	,,	,,
Best Dipped Salt Glazed Stretchers, and Header	12	0	0	,,	,,	,,
Quoins, Bullnose, and Flats.....	14	0	0	,,	,,	,,
Double Stretchers	15	0	0	,,	,,	,,
Double Headers...	14	0	0	,,	,,	,,
One Side and two Ends	15	0	0	,,	,,	,,
Two Sides and one End	15	0	0	,,	,,	,,
Splays, Chamferred, Squints	14	0	0	,,	,,	,,
Second Quality White and Dipped Salt Glazed	2	0	0	,,	less than best.	

BRICKS, &c.—(*continued*).

	s.	d.		
Thames and Pit Sand.....	7	3	per yard,	delivered.
Thames Ballast.....	6	0	,,	,,
Best Portland Cement	30	0	per ton,	,,
Best Ground Blue Lias Lime	21	0	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s.	d.		
BATH STONE—delivered on road waggons, Paddington Depôt	1	6½	per ft. cube.	
Do. do. delivered on road waggons, Nine Elms Depôt	1	8¼	,,	,,
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2	1	,,	,,
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2	2½	,,	,,

	s.	d.		
Ancaster in blocks	1	11	per ft. cube,	deld. rly. depôt.
Beer ,, ...	1	6	,,	,,
Greenshill ,, ...	1	10	,,	,,
Darley Dale in blocks...	2	4	,,	,,
Red Corsehill ,,	2	5	,,	,,
CloseburnRedFreestone	2	0	,,	,,
Red Mansfield ,,	2	4	,,	,,

YORK STONE—*Robin Hood Quality.*

Scappled random blocks	2	10	,,	,,
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per ft. super.	,,
6 in. rubbed two sides ditto, ditto	2	6	,,	,,
3 in. sawn two sides slabs (random sizes)	0	11½	,,	,,
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7¼	,,	,,
1½ in. to 2 in. ditto, ditto	0	6	,,	,,

HARD YORK—

Scappled random blocks	3	0	per ft. cube,	,,
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2	8	per ft. super.	,,
6 in. rubbed two sides ditto	3	0	,,	,,
3 in. sawn two sides (slabs random sizes)	1	2	,,	,,
2 in. self-faced random flags	0	5	,,	,,
Hopton Wood (Hard Bed) in blocks	2	3	per ft. cube.	deld. rly. depôt.
,, ,, ,, 6 in. sawn both sides landings	2	7	per ft. super.	deld. rly. depôt.
,, ,, ,, 3 in. do.	1	2½	,,	,,

SLATES.

in.	in.	£	s.	d.		
20 × 10	best blue Bangor	13	2	6	per 1000 of 1200	at r. d.
20 × 12	,, ,,	13	17	6	,,	,,
20 × 10	first quality ,,	13	0	0	,,	,,
20 × 12	,, ,, ,,	13	15	0	,,	,,
16 × 8	,, ,, ,,	7	5	0	,,	,,
20 × 10	best blue Portmadoc	12	12	6	,,	,,
16 × 8	,, ,,	6	12	6	,,	,,
20 × 10	best Eureka unfading green .	15	17	6	,,	,,
20 × 12	,, ,,	18	7	6	,,	,,
18 × 10	,, ,,	13	5	0	,,	,,
16 × 8	,, ,,	10	5	0	,,	,,
20 × 10	permanent green	11	12	6	,,	,,
18 × 10	,, ,,	9	12	6	,,	,,
16 × 8	,, ,,	6	12	6	,,	,,

TILES.

	s.	d.		
Best plain red roofing tiles .	42	0	per 1000 at	rly. depôt.
Hip and Valley tiles ...	3	7	per doz.	,, ,,
Best Brosely tiles.....	50	0	per 1000	,, ,,
Do. Ornamental tiles	52	6	,,	,, ,,
Hip and Valley tiles ...	4	0	per doz.	,, ,,
Best Ruabon red, brown, or brindled do. (Edwards)	57	6	per 1000	,, ,,
Do. Ornamental do	60	0	,,	,, ,,
Hip tiles	4	0	per doz.	,, ,,
Valley tiles	3	0	,,	,, ,,
Best Red or Mottled Staffordshire do. (Peakes).....	51	9	per 1000	,, ,,
Do. Ornamental do.....	54	6	,,	,, ,,
Hip tiles	4	1	per doz.	,, ,,
Valley tiles	3	8	,,	,, ,,
Best "Rosemary" brand plain tiles.....	48	0	per 1000	,, ,,
Best Ornamental tiles	50	0	,,	,, ,,
Hip tiles	4	0	per doz.	,, ,,
Valley tiles	3	8	,,	,, ,,
Best "Hartshill" brand plain tiles, sand faced.	50	0	per 1000	,, ,,
Do. pressed.....	47	6	,,	,, ,,
Do. Ornamental do	50	0	,,	,, ,,
Hip tiles	4	0	per doz.	,, ,,
Valley tiles	3	6	,,	,, ,,

WOOD.

	£	s.	d.		£	s.	d.
	At per standard.						
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	15	10	0		16	10	0
Deals: best 3 by 4.....	14	10	0		15	10	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	10	0		12	10	0
Battens: best 2½ by 6 and 3 by 6 ..	0	10	0	less than 7 in. and 8 in.			
Deals: seconds	1	0	0	less thn best			
Battens: seconds	0	10	0	,, ,, ,,			
2 in. by 4 in. and 2 in. by 6 in....	9	0	0		9	10	0
2 in. by 4½ in. and 2 in. by 5 in....	8	10	0		9	10	0

WOOD (*continued*).

	£	s.	d.		£	s.	d.
	At per standard.						
Foreign Sawn Boards—							
1 in. and 1¼ in. by 7 in.	0	10	0	more than battens.			
¾ in.	1	0	0	,,			
	At per load of 50 ft.						
Fir timber: best middling Danzig or Memel (average specification)	4	10	0		5	0	0
Seconds	4	5	0		4	10	0
Small timber (8 in. to 10 in.) ...	3	12	6		3	15	0
Small timber (6 in. to 8 in.)	3	0	0		3	10	0
Swedish balks	2	15	0		3	0	0
Pitch-pine timber (30 ft. average)	3	5	0		3	15	0
JOINERS' WOOD.	At per standard.						
White Sea: first yellow deals, 3 in. by 11 in	23	0	0		24	0	0
3 in. by 9 in.	21	0	0		22	10	0
Battens, 2½ in. and 3 in. by 7 in.	17	0	0		18	10	0
Second yellow deals, 3 in. by 11 in.....	18	10	0		20	0	0
,, ,, 3 in. by 9 in.	17	10	0		19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0		14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.	15	10	0		16	10	0
Battens, 2½ in. and 3 in. by 7 in.	11	10	0		12	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	21	0	0		22	10	0
Do. 3 in. by 9 in.....	18	0	0		19	10	0
Battens.....	13	10	0		15	0	0
Second yellow deals, 3 in. by 11 in.	16	0	0		17	0	0
Do. 3 in. by 9 in.....	14	10	0		16	0	0
Battens.....	11	0	0		12	10	0
Third yellow deals, 3 in. by 11 in.	13	10	0		14	0	0
Do. 3 in. by 9 in.....	18	0	0		14	0	0
Battens.....	10	0	0		11	0	0
White Sea and Petersburg :—							
First white deals, 3 in. by 11 in.	14	10	0		15	10	0
,, ,, 3 in. by 9 in.	13	10	0		14	10	0
Battens	11	0	0		12	0	0
Second white deals, 3 in. by 11 in.	13	10	0		14	10	0
,, ,, 3 in. by 9 in.	12	10	0		13	10	0
,, ,, battens	9	10	0		10	10	0
Pitch-pine: deals.....	16	10	0		20	0	0
Under 2 in. thick extra	0	10	0		1	0	0
Yellow Pine—First, regular sizes	40	0	0	upwards.			
Oddments	28	0	0	,,			
Seconds, regular sizes.....	30	0	0	,,			
Yellow Pine oddments	25	0	0	,,			
Kauri Pine—Planks, per ft. cube .	0	3	6		0	5	0
Danzig and Stettin Oak Logs—							
Large, per ft. cube	0	2	6		0	3	6
Small ,, ,, ...	0	2	3		0	2	6
Wainscot Oak Logs, per ft. cube.	0	5	0		0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	8		0	0	9
¾ in. do. do.	0	0	7		—		
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch ...	0	0	9		0	1	0
Selected, Figury, per ft. sup. as inch	0	1	6		0	2	6
Dry Walnut, American, per ft. sup. as inch	0	0	10		0	1	0
Teak, per load	17	0	0		21	0	0
American Whitewood Planks, per ft. cube.....	0	4	0		—		
Prepared Flooring—	Per square.						
1 in. by 7 in. yellow, planed and shot	0	13	6		0	17	6
1 in. by 7 in. yellow, planed and matched	0	14	0		0	18	0
1¼ in. by 7 in. yellow, planed and matched	0	16	0		1	0	0
1 in. by 7 in. white, planed and shot	0	12	0		0	14	6
1 in. by 7 in. white, planed and matched	0	12	6		0	15	0
1¼ in. by 7 in. white, planed and matched	0	15	0		0	16	6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0		0	13	6
1 in. by 7 in. do. do.	0	14	0		0	18	0
¾ in. by 7 in. white do. do.	0	10	0		0	11	6
1 in. by 7 in. do. do. do.	0	11	6		0	13	6
6 in. at 6d. to 9d. per square less than 7 in.							

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton.						
	£	s.	d.		£	s.	d.
Rolled Steel Joists, ordinary sections	6	5	0	...	7	5	0
Compound Girders, ordinary sections	8	2	6	...	9	5	0
Angles, Tees and Channels, ordinary sections	7	17	6	...	8	17	0
Flitch Plates	8	5	0	...	8	15	0
Cast Iron Columns and Stanchions including ordinary patterns	7	2	6	...	8	5	0

METALS.

	Per ton, in London.						
	£	s.	d.		£	s.	d.
IRON—							
Common Bars	7	5	0	...	7	15	0
Staffordshire Crown Bars, good merchant quality..... ..	7	15	0	...	8	5	0
Staffordshire "Marked Bars"	10	0	0	...	—		
Mild Steel Bars.....	8	15	0	...	9	5	0
Hoop Iron, basis price	9	5	0	...	9	10	0
,, ,, Galvanized	17	10	0	...	—		
(*And upwards, according to size and gauge.)							
Sheet Iron, Black—							
Ordinary sizes to 20 g.	9	15	0	...	—		
,, ,, 24 g.	10	15	0	...	—		
,, ,, 26 g.	12	5	0	...	—		
Sheet Iron, Galvanised, flat, ordinary quality—							
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.....	12	15	0	...	—		
Ordinary sizes to 22 g. and 24 g.	13	5	0	...	—		
,, ,, 26 g.	14	5	0	...	—		
Sheet Iron, Galvanised, flat, best quality—							
Ordinary sizes to 20 g.	16	0	0	...	—		
,, ,, 22 g. and 24 g.	16	10	0	...	—		
,, ,, 26 g.	18	0	0	...	—		
Galvanised Corrugated Sheets—							
Ordinary sizes 6 ft. to 8 ft. 20 g.	12	10	0	...	—		
,, ,, 22 g. and 24 g.	13	0	0	...	—		
,, ,, 26 g.	13	15	0	...	—		

PRICES CURRENT.—*Continued on page 303.*

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
Library Building	Benwell and Fenham U.D.C.	75*l.*, 40*l.*, and 25*l.*	Sept. 30
New School, Poulton	Wallasey U.D.C.	Not stated	do.
New Public Offices	do.	250*l.*, 75*l.*, and 50*l.*	Oct. 31
Drainage Scheme	Spezia Municipality	400*l.*	Dec. 31-05

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Public Street Lighting, Roundhay	.....	H. H. Hodgson, Surveyor, North-lane, Roundhay	Sept. 19
Private Street Works	Mountain Ash U.D.C.	Council's Surveyor, Public Offices, Mountain Ash	do.
Jarrah Wood Paving	Finsbury Borough Council	Borough Surveyor, Finsbury Town Hall, Rosebery-avenue	do.
Tar Paving and Re-setting Kerb, etc.	Stevenage U.D.C.	Council Offices, Stevenage	do.
New Tower & Compl. of Church, St. Anne's-on-Sea	.....	Austin & Paley, Architects, Lancaster	do.
Supply of Timber	Lewisham Guardians	Union Offices, 286, High-street, Lewisham	do.
Supply of Granite	Kingston Guardians	Union Offices, Norbiton, Kingston-on-Thames	do.
Paving Setts and Kerbs	Chorley Corporation	Borough Surveyor, Town Hall, Chorley	do.
Flags for Street and other Puposes	do.	do.	do.
Broken Granite and Chippings for Roads	do.	do.	do.
Limestone Chippings	do.	do.	do.
Glazed Earthenware Pipes for Sewers and Drains	do.	do.	do.
Painting at Children's Central Home, Roundhay	Leeds Guardians	The Clerk, Poor Law Offices, Leeds	Sept. 20
Light Railway Extensions	Barking Town U.D.C.	Hawtayne & Zeden, 9, Queen-street-place, E.C.	do.
Erection of Free Library, Horbury	Horbury U.D.C.	B. Watson, Architect, Station-road, Batley	do.
Alterations and Repairs to House	Kingston-on-Thames Guardians	W. H. Hope, Architect, Seymour-road, Hampton Wick	do.
Road Metal	Bangor U.D.C.	Town Hall, Bangor, Co. Down	do.
*Reconstruc. Bdge. over Grand Junc. Canal at Acton-la.	Willesden D.C.	Gordon Thomas, 21, Surrey-street, Strand, W.C.	do.
*Sewer Works in Waxlow-road, Harlesden	do.	O. Claude Robson, M.I.C.E., Public Offices, Dyne-rd., Kilburn, N.W.	do.
*R'dm'k'g, Works, S. Approach-rd., Acton-la., Willesden	do.	do.	do.
Machine Tools	Manchester Tramways Committee	Tramways Department, 55, Piccadilly, Manchester	do.
Making-up Epious Mews	Fulham Borough Council	Borough Surveyor, Town Hall, Fulham, S.W.	Sept. 21
(1) Supply of Water Pipes; (2) Excav. of Pipe Trench	Sowerby Bridge U.D.C.	Waterworks Manager, Council Offices, Sowerby Bridge	do.
Copper Firebox Plates and Steel Panel Plates	East Indian Railway	Secretary's Offices, Nicholas-lane, E.C.	do.
Sewers and Concreting Footways of Street	Leiston-cum-Sizewell U D.C.	J. Baldry, Snape road, Leiston	do.
Paving, etc., Works	Hazel Grove and Bramhall U.D.C.	G. S. Doncaster, Council Offices, Hazel Grove	do.
Hire of Steam Road Rollers	Sevenoaks R.D.C.	R. Bailey, Surveyor, Sundridge	do.
Erection of Warehouse, Abbey Town, Carlisle	.....	G. Armstrong, Architect, 24, Bank-street, Carlisle	do.
Iron Fencing at School, Swanley	Metropolitan Asylums Board	Office of Board, Embankment, E.C.	do.
Wood Paving Works	Hammersmith Borough Council	Borough Surveyor, Town Hall, Hammersmith, W.	do.
Corrugated Iron Building and Fencing at Elec. Wks.	Bedford Borough Council	Borough Electrical Engineer, Cauldwell-road, Bedford	Sept. 22
Firewood Boards	Greenwich Guardians	Union Offices, Greenwich, S.E.	do.
Guernsey Granite Spalls	do.	do.	do.
Supply of Building Materials	Warwick County Lunatic Asylum	At Asylum, Hatton, near Warwick	do.
Electrical Generating & Battery-rooms, etc., Asylum	Monmouth Asylum, Abergavenny	E. A. Johnson, Architect, St. Mary's-chambers, Abergavenny	do.
Cast-Iron Pipes and Valves	Nelson Water Committee	J. Hartley, Waterworks Manager, Town Hall, Nelson	do.
Outer Lock Gates at Bude Harbour	Stratton and Bude U.D.C.	Council Offices, Bude	do.
Buildings at Waterworks	Cork Borough Council	City Engineer, Municipal Buildings, Cork	Sept. 23
*New Coastguard Buildings, Dymchurch, Kent	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
*New Coastguards Buildings, near Lands End	do.	Superintending Civil Engineer, H.M. Dockyard, Devonport	do.
*New Sanitary Arrangements at Schools, Upton Park	St. George-in-the-East Guardians	Clerk's Offices, Ranie-street, Old Gravel-lane, E.	do.
*Painting, etc., at Dispensaries, Clerk's Offices, etc.	do.	do.	do.
Making-up Roads	Yardley R.D.C.	Council's Surveyor, Sparkhill, near Birmingham	Sept. 24
Manual Sluice Valves	Derwent Valley Water Board	E. Sandeman, Barnford, near Sheffield	do.
Road Materials	South Shields Corporation	Borough Engineer, Chapter-row, South Shields	do.
*Wood Fencing	Southgate U.D.C.	Council's Surveyor, Palmer's Green, N.	do.
New Cottage, Cloddiemoss, Dalvey	.....	Peter Fulton, Architect, Forres	Sept. 26
765 Tons of Steel Rolled Joist Gearing	River Wear Commissioners	Engineer's Office, Commissioner's Quay, Sunderland	do.
Reconstruction of Stony-lane Bridge	Southampton County Council	County Surveyor, The Castle, Winchester	do.
New School	Kingston-on-Thames Educa. Com.	F. W. Roper, Architect, 9, Adam-street, Adelphi, W.C.	do.
Extension and Addition of Swimming Bath to Baths	Altrincham U.D.C.	Offices of Council, Town Hall, Altrincham	do.
*Isolation Hosp., Deadman's-la., Gt. Dunmow, Essex	Dunmow R.D.C.	R. Curtis & Son, 11 and 12, Finsbury-square, E.C.	do.
*School Furniture	Ilford U.D.C.	C. J. Dawson, Architect, 11, Cranbrook-road, Ilford	do.
Library Buildings	Tipton U.D.C.	Council's Surveyor, Public Offices, Tipton	Sept. 27
Road Materials and Labour	Leatherhead U.D.C.	Council's Surveyor, Leatherhead	do.
New Sorting Office, Holbeck, Leeds	Commissioners of H.M. Works, etc.	H.M. Office of Works, Storey's Gate, S.W.	do.
Articles for Harbour Works	Aberdeen Harbour Commissioners	Harbour Engineer, Aberdeen	do.
*Making-up Roads	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham	do.
Municipal Buildings	Leigh (Lancashire) Corporation	J. C. Prestwich, Architect, Leigh	Sept. 28
Erect. of 55 Houses, Road-making, etc., nr. Treherbert	Hendrewen Building Club	W. D. Morgan, Architect, Victoria-chambers, Pentre, Glam.	do.
Covered Gds. Wagons, Wheels, etc., Bridgework, etc.	Burma Railway Co., Ltd.	Company's Office, 76, Gresham House, E.C.	do.
Electric Wiring and Cables, Bangour Village	Edinburgh District Lunacy Board	Hippolyte J. Blanc, Architect, 25, Rutland-square, Edinburgh	do.
Telephone Installations	do.	do.	do.
Electric Bells	do.	do.	do.
Granite Spalls	West Ham Union	Clerk's Office, Union Workhouse, Leytonstone, N.E.	do.
New Chapel at Edmonton Workhouse	Edmonton Guardians	T. E. Knightley, Architect, 106, Cannon-street, E.C.	do.
Erection of Ten Labourers' Cottages	North Dublin R.D.C.	Mr. Morris, Clerk of Works, 53, Cabra-road, Dublin	do.
Alterations to Llanfrechfa National School, Mon.	The Managers	W. H. D. Caple, Architect, Church-street-chambers, Cardiff	Sept. 29
Alterations to Park Cottage, Llanfrechfa, Mon.	F. J. Mitchell, Esq., J.P.	do.	do.
Road-making and Paving Works	Portishead U.D.C.	Council's Surveyor, Portishead	do.
Gasholder Tank and Buildings for Gasworks, Herts.	First Garden City, Ltd.	C. Hunt, Engineer, 15, Victoria-street, S.W.	do.
*Building an Area for Boiler Clinker Storage	Southwark Guardians	G. D. Stevenson, Architect, 13, King-street, E.C.	do.
*Drainage, Sanitary Works, etc., at Infirmary	do.	do.	do.
Supply of Stores for Twelve Months, Merthyr Tydfil	Hill's Plymouth Co., Ltd.	Company's Offices, Merthyr Tydfil	Sept. 30
Sewerage and Sewage Disposal Works	Cudworth U.D.C.	Fairbank & Son, C.E., Lendal-chambers, York	do.
*New Coastguard Buildings at Polruan, near Fowey	Admiralty	Superintending Civil Engineer, H.M. Dockyard, Devonport	do.
Granite Macadam	Saffron Walden Corporation	Borough Surveyor, Saffron Walden	Oct. 1
*Construction of Twelve Cottages	County Council of Middlesex	Young & Brown, 104, High Holborn, W.C.	Oct. 3
Broken Granite	Guildford Town Council	Borough Surveyor, Tuns Gate, Guildford	do.
Steam Road Roller and Scarifier	Paddington Borough Council	Town Clerk, Town Hall, Paddington, W.	do.
*Erection of Cartsheds, Workshops, and Offices	Erith U.D.C.	W. Egerton, 12, Queen's-road, Erith	do.
*Forming Roadway and Retaining Wall, Kew Bridge	Brentford U.D.C.	Council's Engineer, Boston-road, Brentford	Oct. 4
Supply of Fine Building Gravel	London County Council	Parks Department, 11, Regent-street, S.W.	do.
Broken Granite	Farnham (Surrey) U.D.C.	Council's Surveyor, Farnham	do.
*Erection of New Council School	Chatham Education Committee	Herbert H. Dunstall, Arch., Bank-chbrs., Railway-st., Chatham	do.
200 Tons of Steelwork in Girders	Gt. Southern and Western Railway	Company's Engineer, Inchicore, Dublin	Oct. 5
New Washing Hall, etc., at South Gray's-close	Edinburgh Corporation	City Architect, City-chambers, Edinburgh	do.
Construction of Pier, etc., Portnoo, Co. Donegal	Board of Public Works, Dublin	Office of Public Works, Dublin	do.
Pumping Machinery and Electric Motors	Richmond Main Sewerage Board	W. Fairley, West Hall-road, Kew Gardens	do.
*Alterations and Additions to St. James'-road School	Wandsworth Guardians	C. A. Sharp, Architect, 11, Old Green-street, S.W.	do.
*Public Library	Poplar Borough Council	J. R. Hunt & Co., 181, Queen Victoria-street, E.C.	do.
*Erection of Disinfecting Station	Wandsworth Borough Council	Council's Surveyor, 215, Balham High-road, S.W.	Oct. 6
Timber Jetty at Cladnageragh, Co. Donegal	Board of Public Works, Dublin	Office of Public Works, Dublin	Oct. 7

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Widening of Carriageways and Footways	Pontypridd U.D.C.	Council's Engineer, Council Offices, Pontypridd	Oct. 10
Steam Motors	do.	do.	do.
Heavy Retaining and Fence Walls	do.	do.	do.
Sewage Disposal Works	Ludlow Corporation	Town Clerk, Ludlow	do.
Sewerage and Sewage Disposal Works	Church Stretton U.D.C.	J. Mansergh & Sons, 5, Victoria-street, S.W.	Oct 11
Extension of Lerwick Harbour	Lerwick Harbour Trustees	J. Barron, Engineer, 216, Union-street, Aberdeen	Oct. 12
*Construction of Light Railways	County Council of Middlesex	H. T. Wakelam, M.Inst.C.E., Guildhall, Westminster, S.W.	do.
*Extensions to Isolation Hospital	Walthamstow U.D.C.	Council's Engineer, Town Hall, Walthamstow	do.
Alterations at Union Offices, Westbar	Sheffield Guardians	H. J. Potter, Architect, 115, Norfolk-street, Sheffield	No date
Extensions to Carbrook Council School	City of Sheffield	H. L. Paterson, Architect, 19, St. James's-street, Sheffield	do.
*Alters., San. Works, etc., Hotel Roy, Leamington Spa	.....	Brown & Barrow, 12, Norfolk-street, Strand, W.C.	do.
*Extension of Electric Lighting Station	Watford U.D.C.	C. P. Ayres, Architect, Watford	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
Sanitary Inspector	Bermondsey Borough Council	130*l.*	Sept. 20
Surveyor and Inspector of Nuisances	Hursley R.D.C.	120*l.*	Sept. 24
Sanitary Inspector	Southwark Borough Council	120*l.*	Sept. 26
Clerk of Works	Dublin Corporation	3*l.* 3s. per week	do.

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, —. *Contracts*, lv. vi. viii. x. *Public Appointments*, —.

PRICES CURRENT.—*Continued from page* 301.

METALS (*continued*). Per ton, in London.

	£	s.	d.		£	s.	d.
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11	15	0	...	—		
Best Soft Steel Sheets, 22 g. & 24 g.	12	15	0	...	—		
" " " 26 g.	14	0	0	...	—		
Cut nails, 3 in. to 6 in. (Under 3 in., usual trade extras.)	9	0	0	...	9	10	0

LEAD, &c.

	Per ton, in London. £	s.	d.		£	s.	d.
LEAD—Sheet, English, 3lb. and up	14	10	0	...	—		
Pipe in coils	15	0	0	...	—		
Soil pipe	17	10	0	...	—		
Compo pipe	17	10	0	...	—		
ZINC—Sheet—							
Vieille Montagne ...ton	27	10	0	...	—		
Silesian	27	5	0	...	—		
COPPER—							
Strong Sheet...per lb.	0	0	10	...	—		
Thin " ... "	0	0	11	...	—		
Copper nails ... "	0	0	10	...	—		
BRASS—							
Strong Sheet... "	0	0	9½	...	—		
Thin " ... "	0	0	10	...	—		
TIN—English Ingots ... "	0	1	3½	...	—		
SOLDER—Plumbers' ... "	0	0	6½	...	—		
Tinmen's... "	0	0	8	...	—		
Blowpipe... "	0	0	9	...	—		

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¼d.	per ft. delivered.
" fourths	1⅞d.	" "
21 oz. thirds	3¼d.	" "
" fourths	2⅞d.	" "
26 oz. thirds	4¼d.	" "
" fourths	3⅝d.	" "
32 oz. thirds	5¼d.	" "
" fourths	4⅝d.	" "
Fluted Sheet, 15 oz.	3¼d.	" "
" 21 oz.	4¼d.	" "
½ Hartley's Rolled Plate	1⅞d.	" "
⅝ " " "	2d.	" "
¾ " " "	2¼d.	" "

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	1	7
" " " in barrels	"	0	1	8
" " " in drums	"	0	1	10
Boiled " " in pipes	"	0	1	9
" " " in barrels	"	0	1	10
" " " in drums	"	0	2	0
Turpentine, in barrels	"	0	3	4
" in drums	"	0	3	6
Genuine Ground English White Lead	per ton	18	15	0
Red Lead, Dry	"	18	10	0
Best Linseed Oil Putty	per cwt.	0	6	6
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c. Per gallon.

	£	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	0
Fine Elastic Carriage	0	12	6
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	16	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flatting Varnish	0	18	0
White Copal Enamel	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
French and Brush Polish	0	10	0

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted*

AMERSHAM. — For grammar school, for the governors of Dr. Challoner's Grammar School. Mr. H. Belch, architect:—
G. Darlington, Amersham* £5,268

BRADFORD.—For Sunday Schools and parochial institute (contracts 1 and 3), for the Parish of Saint Clement, Bradford, Yorks. Mr. H. E. Priestley, architect, 17, Bertram-road, Bradford. Quantities by architect:—

		£	s.	d.
Mason's Work:	O. Booth & Son, Great Horton*	1,120	0	0
Joiner's Work:	W. Pickering, Bradford*	573	7	9
Slater's Work:	T. Nelson & Son, Manningham*	178	0	0
Plasterer's Work:	J. & W. Bates, Bradford*	96	0	0
Plumber's Work:	O. Smith, Great Horton*	219	16	0
Painter's Work:	J. Walmsley & Sons, Bradford*	49	15	0
Total		£2,236	18	9

BRIDLINGTON. — For partial remaking, etc., Sewerby-crescent. Mr. S. Dyer, architect and surveyor, 29, Quay-road, Bridlington:—

J. Ellis	£650	Musk & Son, Bridlington*	£323
J. Rennard & Co.	402		
J. N. Davison	396		

BURGESS HILL.—For erecting stabling, etc., at Depôt, Clifton-road, for the Urban District Council:—

Box & Turner	£355 0 0	A. Downer, Burgess Hill*	£312 0 0
W. Ornam	342 16 6		
W. Bryant	330 10 0		

CARDIFF.—For erecting an electric light substation at Adelaide-street, at the Docks, for the Corporation. Mr. W. Harpur, Borough Engineer, Town Hall, Cardiff:—
M. D. W. Davies, St. Mary-street, Cardiff £1,830 19 7

CARDIFF.—For 190 yards of wrought-iron unclimbable fencing and gates and re-erecting, etc., 280 yards of fencing at Cathays Park, for the Corporation. Mr. W. Harpur, Borough Engineer, Town Hall, Cardiff:—

Rubery & Co.	£293 11 6	Mountford, Phillips & Co., Ltd., Llantrisant*	£140 6 4½
W. A. Baker & Co., Ltd.	270 15 9		
W. Rowe	243 11 9		
G. Kyte & Co.	212 6 8		

CHIPPING CAMPDEN.—For water supply works, Campden (Contract 2), for the Rural District Council. Messrs. Willcox & Raikes, engineers, Union-chambers, 63, Temple-row, Birmingham:—

Reid Bros.	£2,418 0 0	T. Vale & Sons, Ltd.	£1,848 0 0
G. M. Kerry & Co.	2,105 0 0	J. Riley	1,831 3 5
W. H. Smith & Sons	2,070 9 6	Rowell & Sons, Chipping Norton*	1,801 4 0
Rogers & Wood	1,896 0 0		
J. E. White	1,850 0 0		

CHIPPING CAMPDEN (Glos.). — For waterworks (Contract No. 1), for the Rural District Council. Messrs. Willcox & Raikes, engineers, Union-chambers, 63, Temple-row, Birmingham:—

J. & R. Ritchie, Ltd.	£1,252 2 3
Yarrow & Co.	1,204 0 0
A. G. Cloake	1,196 16 8
Stanton Ironworks Co., Ltd.	1,146 10 0
T. Spittle, Ltd.	1,143 11 8
Isca Foundry Co.	1,136 4 3
Cochrane & Co.	1,118 11 5
Staveley Coal & Iron Co., Ltd., nr. Chesterfield*	1,093 18 3
J. & S. Roberts, Ltd.	1,077 15 9
D. Parsons & Co.	1,029 4 11

CRUMLIN.—For sinking wells and providing pumps at Crumlin, for the South Dublin Rural District Council. Mr. T. J. Byrne, A.R.I.B.A., surveyor, etc., 1, James-street, Dublin:—
J. Stevens, J. Kennedy, P. Healy, J. Grace, 124, Coombe, Dublin* — This work is tendered for on schedules; the price of a well cannot therefore be known until it is completed.

DRIFFIELD (Yorks.).—For constructing a main sewer at the east end of North Frodingham Village, for the Rural District Council. Mr. T. Carson Beaumont, C.E., surveyor, Driffield:—

A. Leason	£195 0 0	J. W. Hall	£163 0 0
W. Leason & Son	185 0 0	W. Ditty	130 0 0
R. Fisher	180 10 0	T. Cammidge, N. Frodingham*	118 17 3
J. Dunn	170 19 0		

EAST SHEEN.—For alterations to Nos. 65 and 67, Sheen-lane, Mortlake, for Mr. J. W. Saunders. Mr. R. B. Rowell, architect, Triangle-corner, East Sheen, S.W.:—

S. N. Soole & Son	£302 0	Hayes & Co., St. Leonard's-road, East Sheen, S.W.	£248 0
Speechley & Smith	278 10		

EPPING.—For erecting Council Buildings in High-street, for the Urban District Council:—

S. Kind	£997 10 0	A. A. Knight	£940 0 0
H. Wells & Sons	990 0 0	T. Keen	939 12 6
C. S. Foster & Son	985 0 0	G. Whiffin, Coopersale, Epping‡	748 5 0
T. Almond & Son, Ltd.	975 0 0		

[‡Accepted provisionally.]

HARTSHORNE.—For pulling down old bridge in Green's-lane, and erecting a new bridge, for Hartshorne and Seals Rural District Council. Mr. A. Lewis, surveyor, Smisby, near Ashby-de-la-Zouch:—

E. Clarke, Woodville*	£95 10 0	E. Berrisford	£95 0 0

HEREFORD.—For the erection of cycle and motor works and alteration to premises, 116, St. Owen-street, for Mr. A. W. Marriott. Messrs. Groome & Bettington, architects and surveyors, Palace-chambers, King-street, Hereford. Quantities by the architects:—

P. Cooke	£1,508 15 4	W. Powell	£1,122 10 0
Bolt, Davies, & Co.	1,135 0 0	C. Cooke, Hereford*	1,108 0 0
W. Bowers & Co.	1,130 13 0		

HERTS.—For Baptist Church, Breachwood Green, Welwyn, Herts. Messrs. George Baines and R. Palmer Baines, 5, Clement's-inn, Strand, London, W.C., architects :—

	Estimate A.		Estimate A.
F. Gough & Co.	£2,284 0 0	T. Almond & Son, Ltd. ..	£1,950 0 0
D. Parkins ..	2,240 0 0	Goldhawk & Son	1,914 6 8
T. & E. Neville	2,220 0 0	S. Redhouse ..	1,863 0 0
C. Miskin & Sons	2,179 0 0	Mallett & Wood, Grove-road, Luton‡	1,766 0 0
F. Newton....	2,150 0 0		
W. G. Dunham	2,075 0 0		

‡ Accepted with modifications.

HESWALL (Cheshire).—For the construction of Dawstone-road, for the Wirral Rural District Council. Mr. T. Davies, 33, Kingsland-road, Birkenhead :—

R. T. Amery, Parkgate‡	£686 10	S. Hutton, Bowdon‡	£650
		R. Hughes, Brimstage‡	625

‡ Not accepted, being above the estimate.

IPSWICH.—For the erection of receiving wards at the Workhouse, Woodbridge-road, for the Guardians. Messrs. Brown & Burgess, architects, Prince's-street, Ipswich :—

S. A. Kenny, Bursell-street, Ipswich*.. £1,377

MAWNAN (near Falmouth).—For erecting a country house and stables at Higher Trerose, Helford River, for Mr. H. Coode. Mr. B. C. Andrew, architect, Biddick's Court, St. Austell :—

S. Trehane	£4,194 0	A. Carkeek	£2,951 0
C. & J. Harris	3,278 16	J. Colliver, Truro*	2,282 0

MILLISLE (co. Down).—For main sewerage, outfall sewer, flushing tanks, &c., for Lord Dunleath. Mr. J. Russell, C.E., 22, Waring-street, Belfast :—

J. A. Gordon	£590	H. McNeilly.....	£370
J. Graham, jun.	442	Path, Clarke, & Son.	370
M. Green	442	H. Alexander, 4, Waring-street, Belfast*	365
J. Ross & Son	438		
F. & J. Quinn	397		

PLYMOUTH.—For electric light installation at Municipal Technical School, for the Education Authority. Mr. H. J. Snell, architect, 11, The Crescent, Plymouth :—

Messrs. Heath & Co., Plymouth £550

PLYMOUTH.—For fitting up hot water heating apparatus and gas installation at the Technical Schools, for the Education Authority. Mr. H. J. Snell, architect, 11, The Crescent, Plymouth :—

W. T. Hocking, Plymouth £820

RETFORD.—For the erection of residence, London-road, for Rev. Justice Chapman. Messrs. Eyre & Southall, architects, Chapelgate :—

G. Fenton	£2,271	C. Jones	£2,066
G. Hopkinson	2,183	F. Fenton	2,024
G. Ledger	2,166	T. Hopkinson*	2,024
G. Hurst	2,131		

RICHMOND (Yorks).—For relaying pipe sewer, etc., for the Corporation. Mr. T. H. Hailstone, Borough Surveyor, Richmond :—

J. Spark, 30, Marshall-st., Darlington.. £126 13

ROBERTON (N.B.).—For 1½ miles of cast-iron pipes and a concrete-covered service tank, etc., for the District Committee of the Upper Ward of the County of Lanark. Messrs. Warren & Stuart, engineers, 94, Hope-street, Glasgow :—

R. C. Crawford, Strathaven £534 8 4

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ROMSEY.—For the erection of an iron bridge over the stream at Tutt's Bridge, West Wellow, and making up approaches, for the Rural District Council. Mr. C. W. Chiddy, Romsey :—

G. F. Hurst & Sons,	£470	Douglas & Richards,	£425
Roles & Sons	460	P. Tryhorn & Son, Salisbury*	282
F. Osman	453		

SELBY.—For laying 1,105 yards of 12-in. stoneware pipes, &c., for the Urban District Council. Mr. Bruce McGregor Gray, A.M.I.C.E. :—

J. T. Short....	£349 5 10	J. Smith, Selby*	£241 17 4
J. Slinger	296 12 11	G. Hird.....	241 1 1
T. Bell	296 9 9		
A. Speight....	245 1 3		

STANFORD-LE-HOPE (Essex). — For executing street works, for Orsett Rural District Council. Mr. S. I. Adams, surveyor, Weston-chambers, Southend-on-Sea :—

G. W. Cooke.	£3,902 11 3	J. E. Truman	£2,999 0 0
W. E. Westgate.....	3,465 0 0	Buxton & Jenner ..	2,693 0 0
G. J. Anderson	3,157 2 1	W. Iles	2,509 0 0
T. Bruty....	3,071 1 10	J. Jackson, Forest Gate* ..	2,325 0 0
Wilson Borden & Co	3,047 17 8		

STOCKTON-ON-TEES.—For alterations and additions to Children's Home, Hartington-road, for the Guardians. Mr. John Rodham, surveyor, Finkle-street, Stockton-on-Tees :—

J. Coulthard..	£468 5 11	R. Johnson & Sons	£433 17 6
G. E. Grey ..	456 3 2	W. C. Atkinson & Son, Stockton-on-Tees* ..	427 12 7
T. Brown ..	446 0 0		
J. G. Robson & Sons	443 2 8		
G. Race & Sons	440 0 0		

WAREHAM.—For water supply works, for the Corporation. G. Chatterton, engineer, 6, The Sanctuary, Westminster, S.W. :—

T. Docwra & Son, Balls Pond, London* £5,779 18 11

WHITSTABLE.—For the erection of new infants' school, Cromwell-road, Whitstable, for the Kent Education Authority. Mr. A. A. Kemp, architect :—

C. W. Welby.....	£4,500	A. S. Ingleton	£3,877
Sturry Building Co.	4,180	Gann & Co.	3,422
T. Porter	4,140	Amos & Foad	3,350
T. Gotafinch	4,074	E. Solly*	3,270

*Recommended for approval to the works committee.

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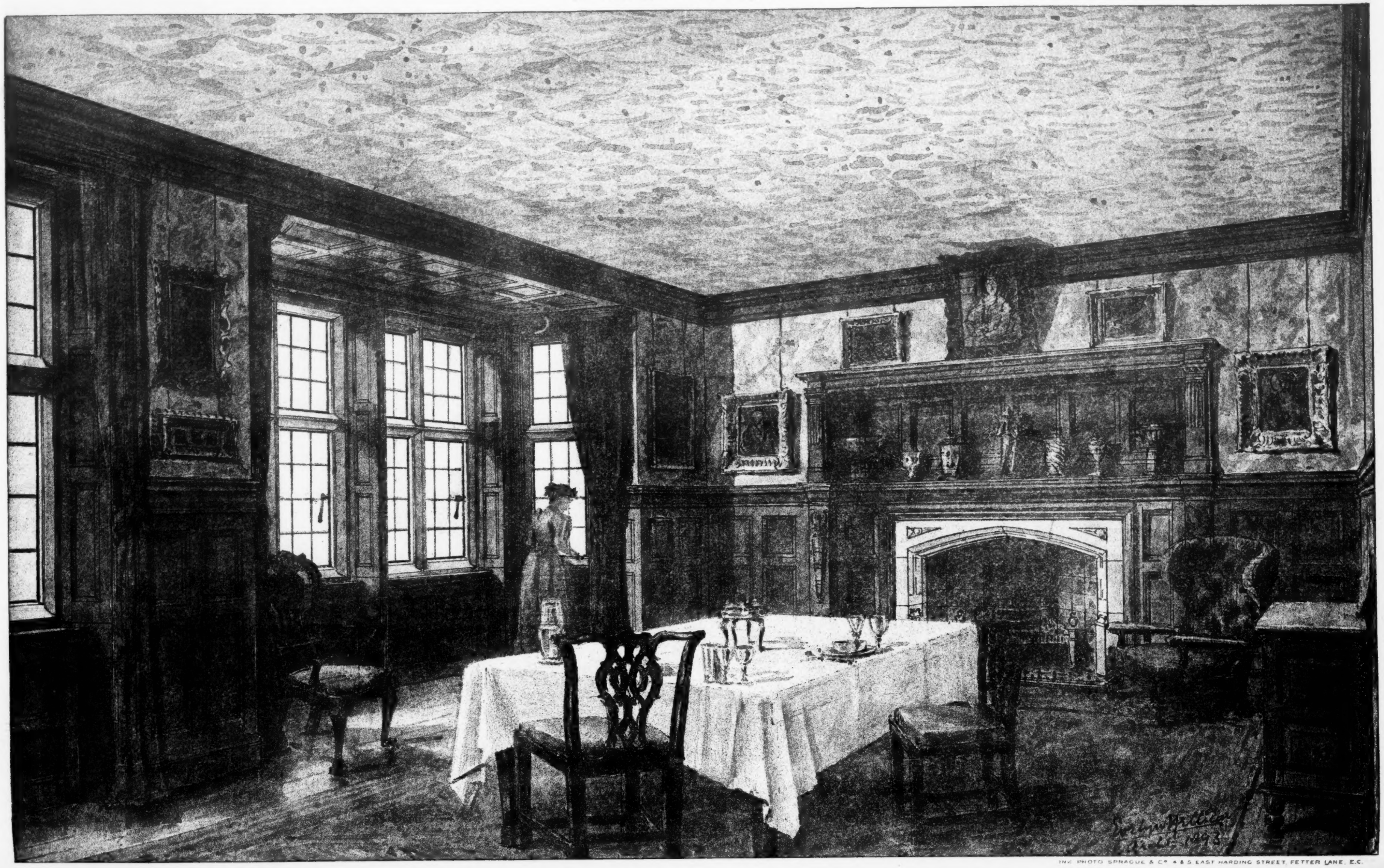

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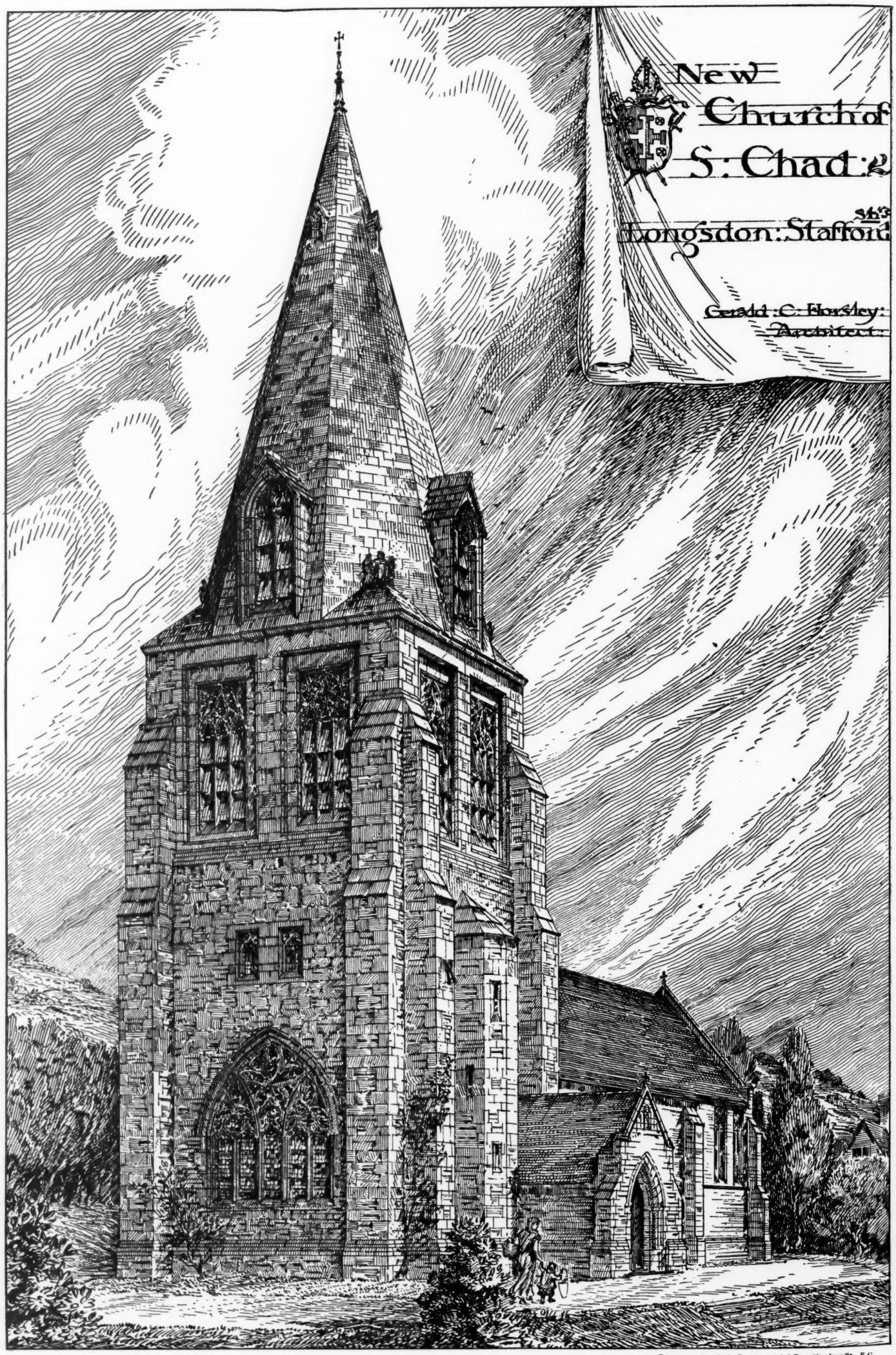

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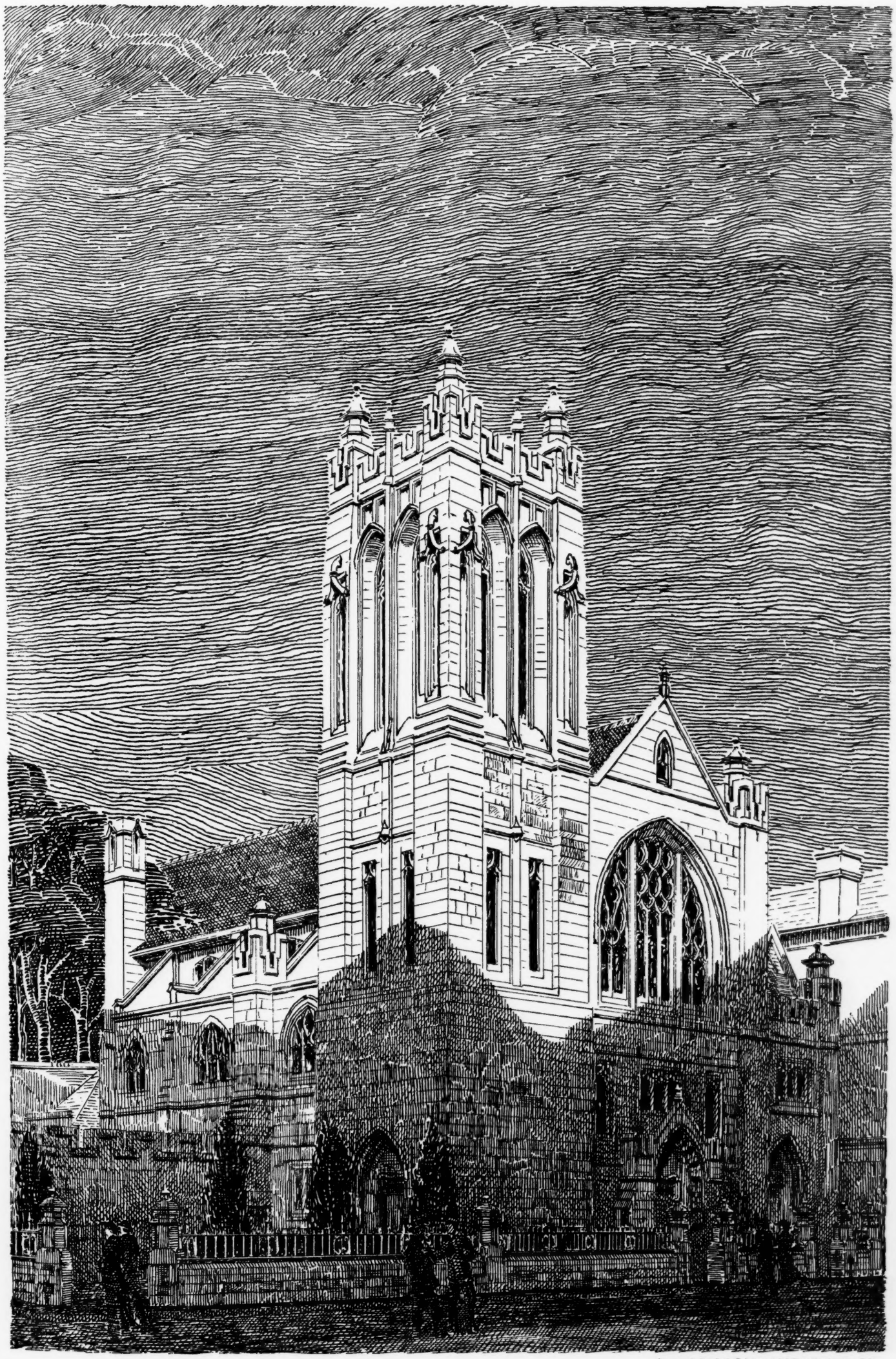

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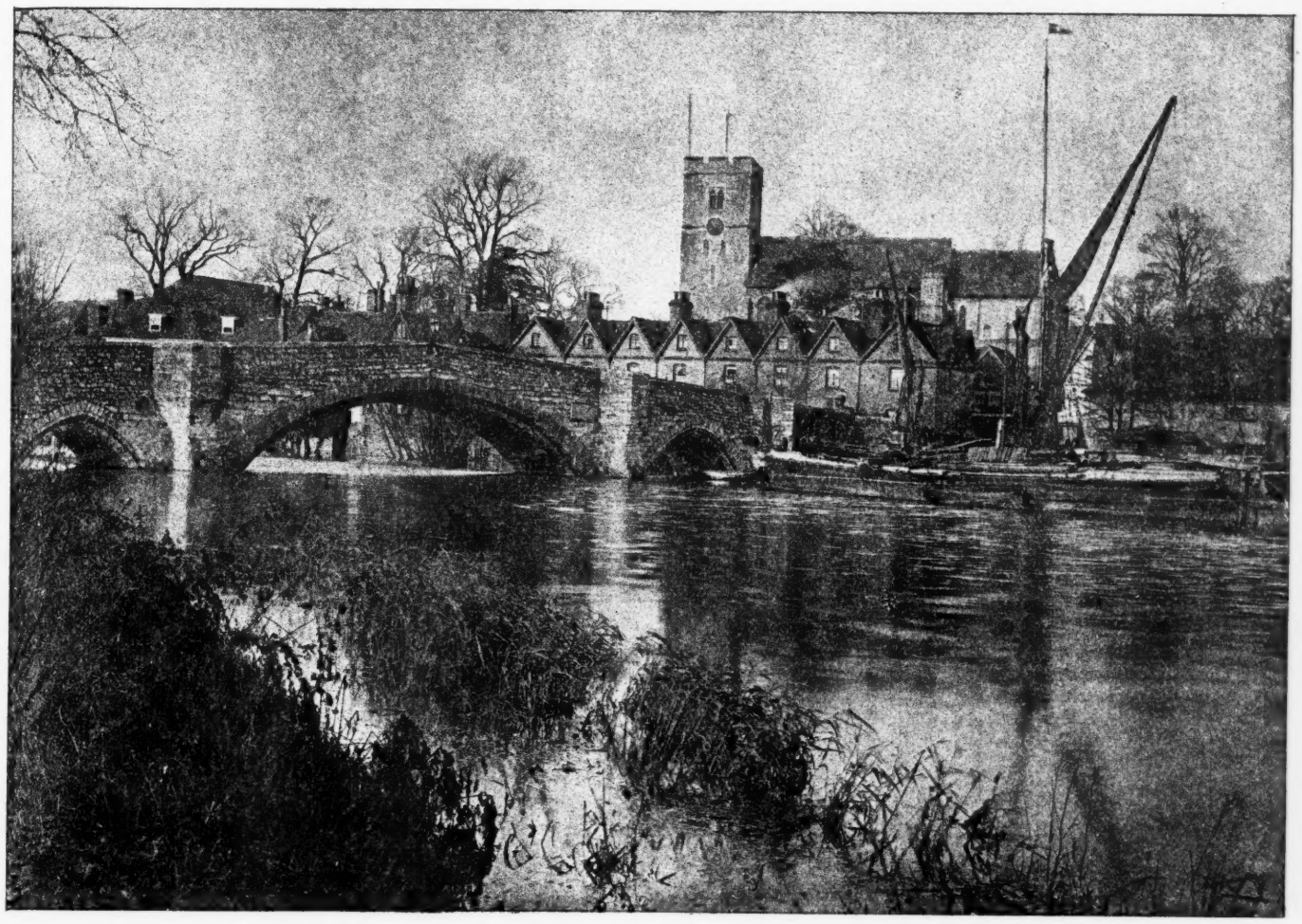

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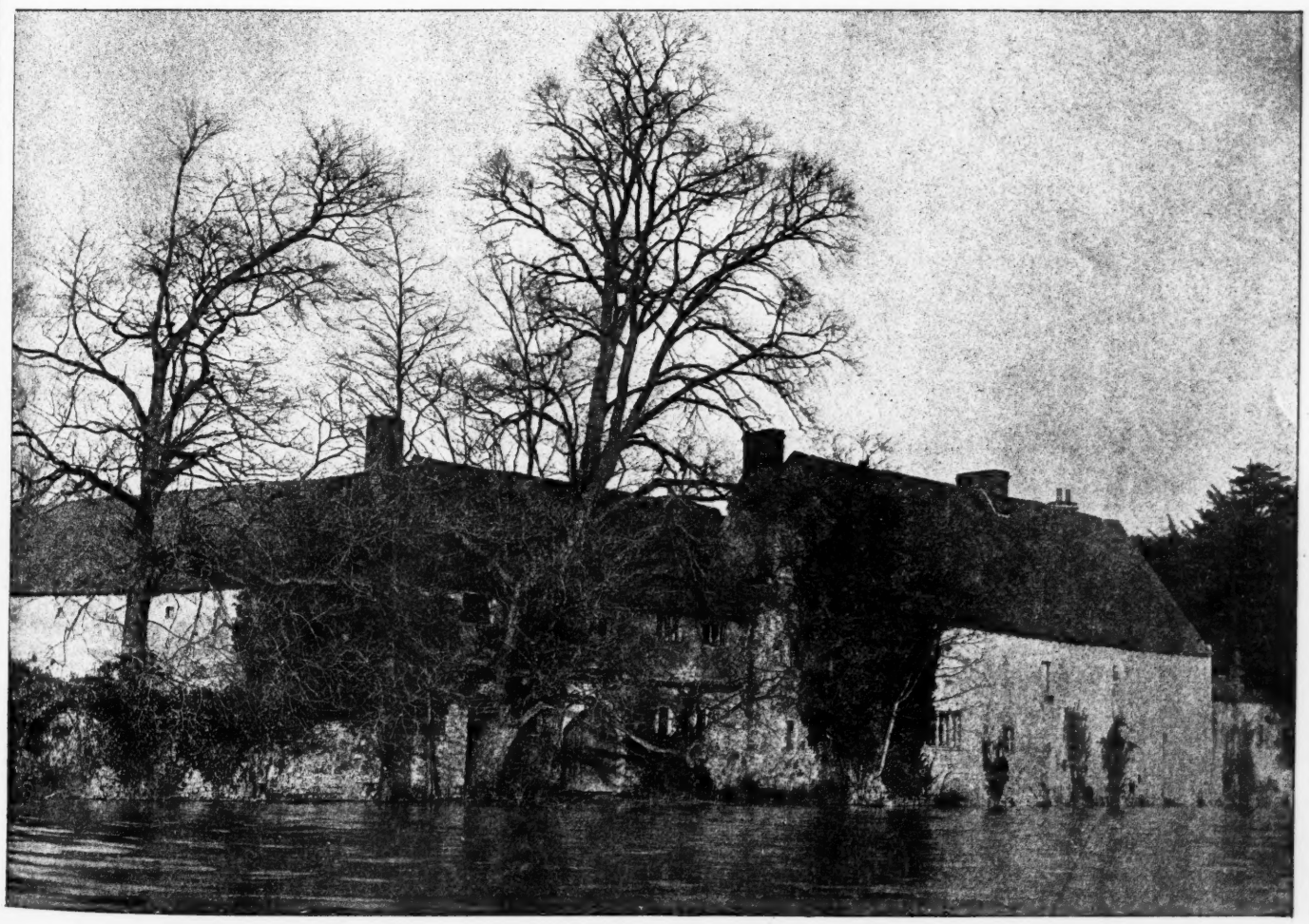

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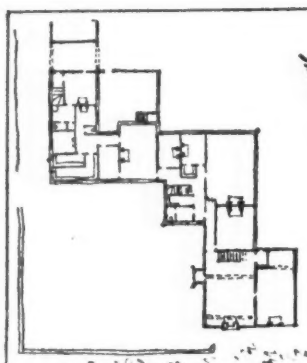

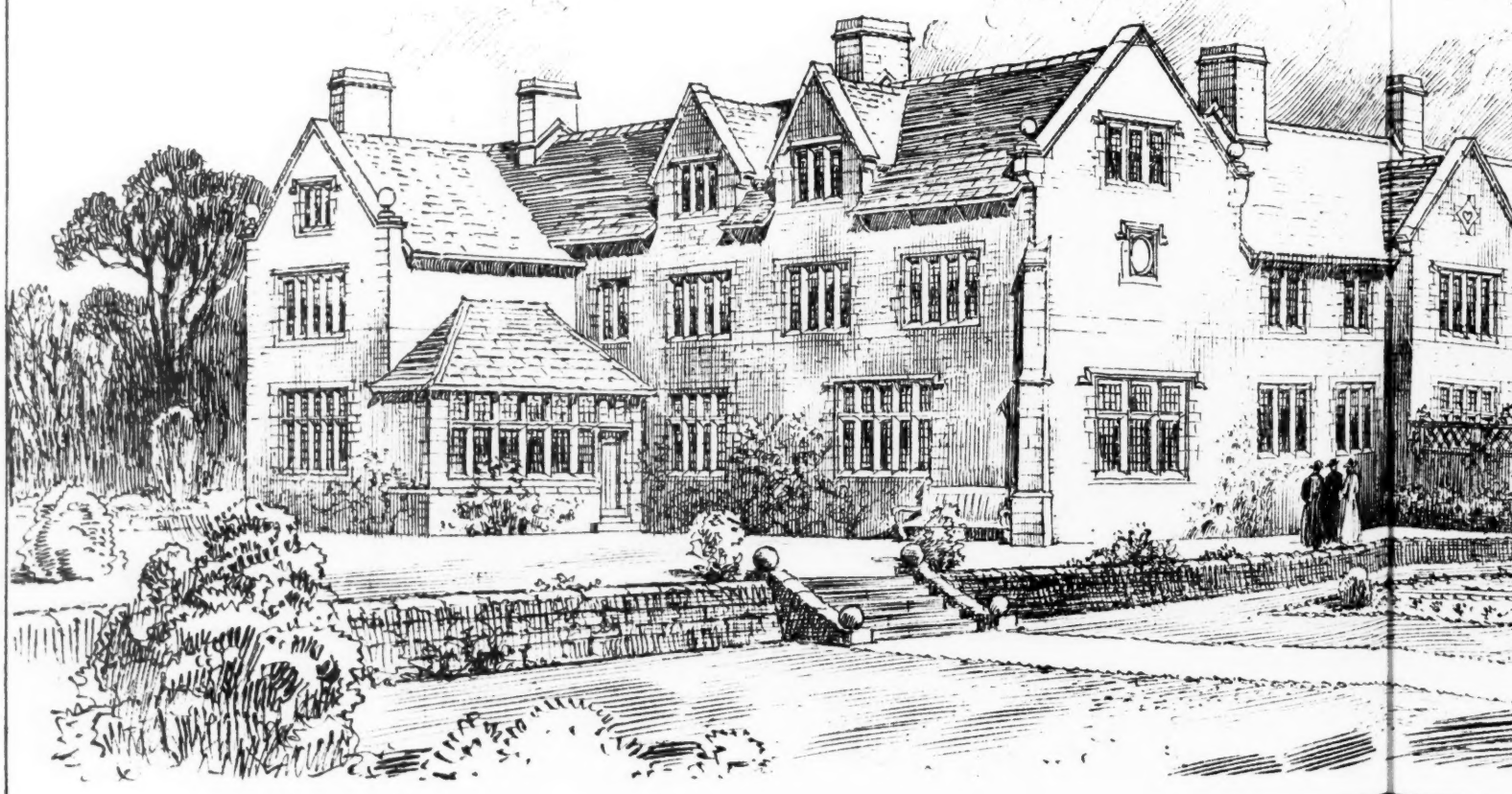

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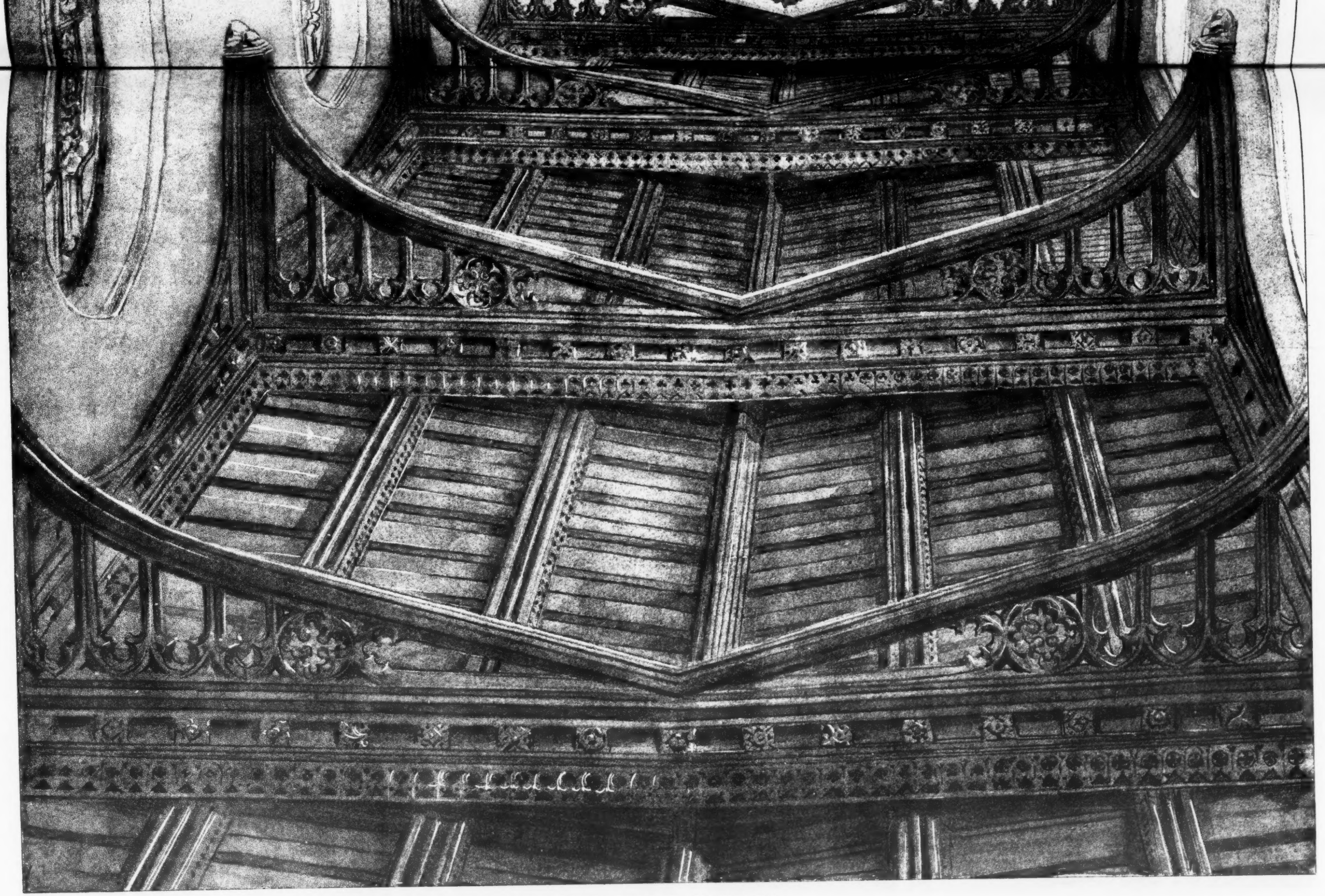

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